



FlightAssistant

Your best co-pilot on an Android device

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Concepts

FlightAssistant is an aeronautical moving map GPS application for Android devices.

The goal of FlightAssistant is to bring a synthetic view of its navigation to the pilot in order to let them focus on flying the plane and ensuring in flight safety.

Through a clear presentation of flight data, FlightAssistant will allow you to fly "straight on the line" according to the flight you prepared.

As FlightAssistant works on small size devices, it does not try to copy the user interface of traditional aeronautical GPSs or glass cockpit suites (most of time unavailable for the average pilot).

On the other hand FlightAssistant follows interface concepts of modern mobile platforms and allows the user to test and explore the application.

FlightAssistant will also adapt to the changes that can happen during the flight, whether they are due to traffic control, meteorology or the pilot's own will.

Of course, FlightAssistant has a GOTO and NEAREST function that will lead you to the nearest airport from your current location or to a place of your choice.

Though it is not meant to replace the documents that you are required to have on board, FlightAssistant is also an electronic document repository and its "document binder" feature will give you immediate access to all airports data and charts¹ (automatically downloaded before the flight).

Flight Assistant is a helper application, by using it you recognize that you are able to fly without it, safely and in compliance with all the official rules and regulations that may apply.

What FlightAssistant is not:

- ❖ it's not a replacement for a flight instrument you should have on board,
- ❖ it's not a flight instrument recognised by an official certification body,
- ❖ it's not a replacement for the documentation you should have on board.

¹ Availability of airport chart may vary from a country to another

Getting started


You have just installed FlightAssistant and cannot wait to try it out?

Follow the steps below, it's the shortest way to the take off!

1. Define your data subscriptions

In the settings section (either on the home page if you use a tablet, or after tapping the "Settings" button if you use a phone), tap "Documents Subscriptions" and define your subscriptions by clicking the "Edit" button (see [Managing AIP data](#)).

Choose your country (or country + region), the kind of points that you want to import and the FIRs (Flight Information Region) in which you will fly.

When touching "back" () , accept to refresh the AIP data.

2. Update your data

Your community AIP data are now up to date. Still on the documents binder, press the "Download" button in the "Airports charts" section, this will download all the available airport charts for your AIP subscription ("Select airports" has to be on "all" and you have to be connected to Wifi).

You now have all the airports charts (or diagrams) available for your country (or country + region).

If you think that you will fly soon, download the TAFs, METARs and NOTAM's (see [Downloading TAFs and METARs](#) and [Selecting and downloading NOTAMs](#)).

3. Download your maps packs

FlightAssistant offers maps that you can download and install from the "Map store" (though called a "store", all maps are free ;).

Select the map (or maps) for you country / region, it should take less than one minute to download and install (depending on your Internet / wifi access point speed).

Currently, we offer coverage for the United States and Europe, but we will offer more coverage on demand.

(See [Maps management](#) for details).

NB: if you have built an open source map pack for your country and would like to make it available to your fellow pilots, do not hesitate to visit the [getting involved](#) section of our web site.

4. Define your plane

In the "Settings" section, tap "Plane management", define your plane's performances, weight stations and weight & balance limits (they will be used for flight planning).




And there you go, you are, ready to take off for a free flight!!!


If you want to go a bit further, you can create a flight plan (see [Create/edit/delete a flight plan](#)), then activate it in order to use it during your flight (see [Loading a flight plan](#)).

The core concepts

The modules

The FlightAssistant features are grouped in 3 main modules that you can access from the home page or the FlightAssistant action bar when you are in "cockpit" mode

- ❖ The "home page" () allows access to « primary » FlightAssistant's control functions like settings or activating a flight plan, preparing a flight, starting or stopping a flight.
- ❖ The "cockpit" module () is of course the module to use during your flights, it gathers all the pages useful to the navigation.
- ❖ The "documents binder" module () gathers different documents (airport data, airports diagrams & maps, NOTAMs, weather, etc.)

For each of these 3 modules, FlightAssistant offers some settings () that will allow you to adjust the behaviour of the application.

There are some global settings (from the control panel page) and some other that only relates to the current page.

The navigation modes

FlightAssistant uses the concept of "navigation mode" in order to define the current "state" of the flight.

- ❖ **Free flight:** In this mode FlightAssistant will only display your location, course, speed and altitude. It will not guide you to a destination or on a route.

This mode is automatically engaged if you start navigation without loading a flight plan.

In this mode, some cockpit pages and some virtual instrument will be empty or idle.

- ❖ **Flight plan:** In this mode, FlightAssistant will help you fly according to the navigation you have planned (and loaded), for the route and the altitude (if the flight plan includes altitude settings).

FlightAssistant automatically selects the current navigation leg (based on your location and course), indicates the bearing and distance to the next point and computes the estimated times to each point of your way.

This is the most comprehensive and advanced mode, all the cockpit pages are fully active.

- ❖ **GOTO:** In this mode you will fly a straight route to a chosen point.

This mode takes priority on the other engaged modes (if you were in "Flight plan" mode, the flight plan will remain loaded, but it will be put on standby until you resume it).

You can access the GOTO mode by clicking the "GOTO" button of the action bar on one of the cockpit pages or with the "search" button of your device (if it sports one).

WARNING: a short "press" on the "search" button will let you perform a lookup (by name or ICAO code), when a long "press" will trigger the "nearest" function, proposing you the list of the closest airports (if there is a valid GPS fix).

- ❖ **Direct to:** In this mode, you fly straight to a further point of your flight plan (avoiding the points in between).

FlightAssistant will guide you to this point just as in the "GOTO" mode. The "Flight plan" mode will be automatically reengaged when you will reach this point.

You can then proceed with your flight plan as initially defined for the remaining legs.

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The flight plan

The flight plan in FlightAssistant is not a flight plan in the aeronautical acceptance of the term (like the one you can file to aeronautical authorities, etc...)

It only defines your navigation, in the horizontal and (possibly) vertical axis. It is a list of your navigation legs.

A leg is defined by:

- ❖ its origin;
- ❖ its destination;
- ❖ its cruise altitude (optional). It is the altitude you want to fly between the origin point and the destination point of the leg.

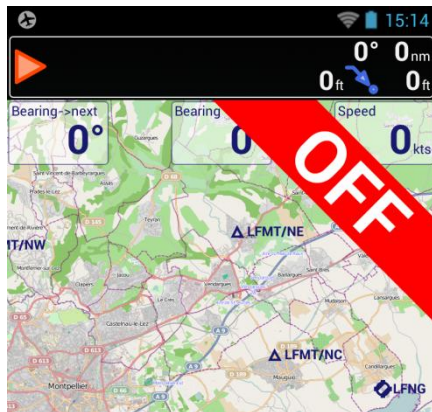
The cruise altitude is acquired from the origin point.

- ❖ its arrival altitude. It's the altitude you want to fly over the destination point.

From that, in "Flight Plan" mode, FlightAssistant will guide you from a point to another and will indicate altitude changes and slopes in order to match cruise and arrival altitudes (if defined).

Loss of GPS signal

If you completely lose the GPS signal during the flight, or if you access one of the cockpit pages without starting navigation, FlightAssistant will display a flag so that you are immediately aware.



Note that you can choose the GPS accuracy threshold in the application preferences.

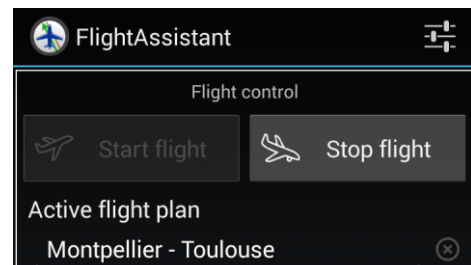


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The action bar

FlightAssistant uses the standard Android action bar when it is possible.

The actions in this bar can change depending on the context and the currently available actions.



On the cockpit pages (used in flight), FlightAssistant uses a custom tool bar that will deploy when you will touch the screen either on the right side (in portrait mode) or the lower end (in landscape mode).

It will display as well if you press the "MENU" key (provided your device has one). The tool bar will retract automatically (see [The cockpit tool bar](#)).

It is to note that if your device has a "MENU" key, you will be able to disable the deployment of the tool bar when touching on the screen (see [The global preferences](#)).



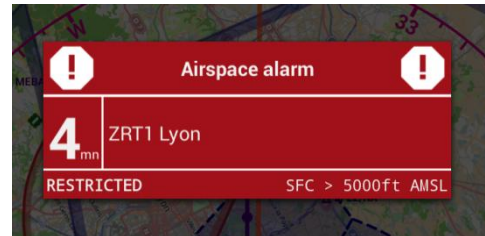
Alarms and warnings

In some circumstances, FlightAssistant can trigger alarms or warnings which we will generically call "alerts" (currently this is only available for airspaces).

The difference between an alarm and a warning is fairly simple.

An alarm will display as a window with a red background.

Most importantly, an alarm is something you need to acknowledge and it won't go away "automatically".



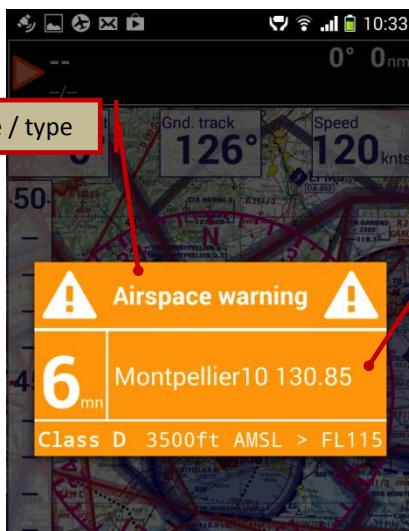
To acknowledge an alarm, just tap on the alarm's panel.

On the other hand a warning will automatically dismiss after "a period of time" (currently set at 15 seconds).

You can as well dismiss a warning before the 15 seconds by tapping the warning window.

Alert title / type

Content & description of the alert



➤ AIRSPACE ALERTS

Airspace alerts will be triggered when there is a risk that you enter an airspace.

You can select which types of airspace you want FlightAssistant to consider, for each of them if you want to receive an alarm or a warning (or none, or both).

You can as well select how long before entering the airspace you want to receive the alarm or the warning.

These preferences are available from the moving map preferences (as you will be able to select which airspaces you want display on this page as well).



Content of an airspace alert

Both airspace alarms and airspace warnings do have the same content.



How FlightAssistant check airspaces

Checking that we are currently flying into a given airspace is not as easy as it seems, indeed we need not only to consider the geographical boundaries of the airspace but the altitude boundaries as well.

Unfortunately we cannot always do this accurately (bear in mind the GPS gives us an altitude AMSL):


- Because the GPS altitude is not accurate
- Because some airspaces are defined by an altitude **above the ground** (and we do not know yet what is the altitude of the ground below the plane)
- Because some airspaces are defined by a **standard altitude (FL)** and we do not know what the current QNH is.

Improvements will possibly come in the future, here is how we do it for now:

- Lower boundaries defined with the surface as reference (i.e. 1500ft ASFC) are converted to **0ft AMSL**.
- Higher boundaries defined with the surface as reference (i.e. 4500ft ASFC) are converted to an **infinite altitude**.
- Standard altitude is considered **equal to current altitude**.
- A 200ft tolerance is added either way of the airspace boundaries (i.e. if your GPS altitude is 4300ft and an airspace lower boundary is 4500ft AMSL, you will be alerted, if an airspace higher boundary is 4500ft AMSL and your GPS altitude is 4700ft, you will be alerted).


Closing FlightAssistant

FlightAssistant does not have a "quit" option menu or button. This is to let as much room as possible for useful items.

To quit FlightAssistant, you have to go to the "control panel" page and press the "back" button () of your device twice.

A message will warn you of the imminent termination of the application.

The home page

Access: 

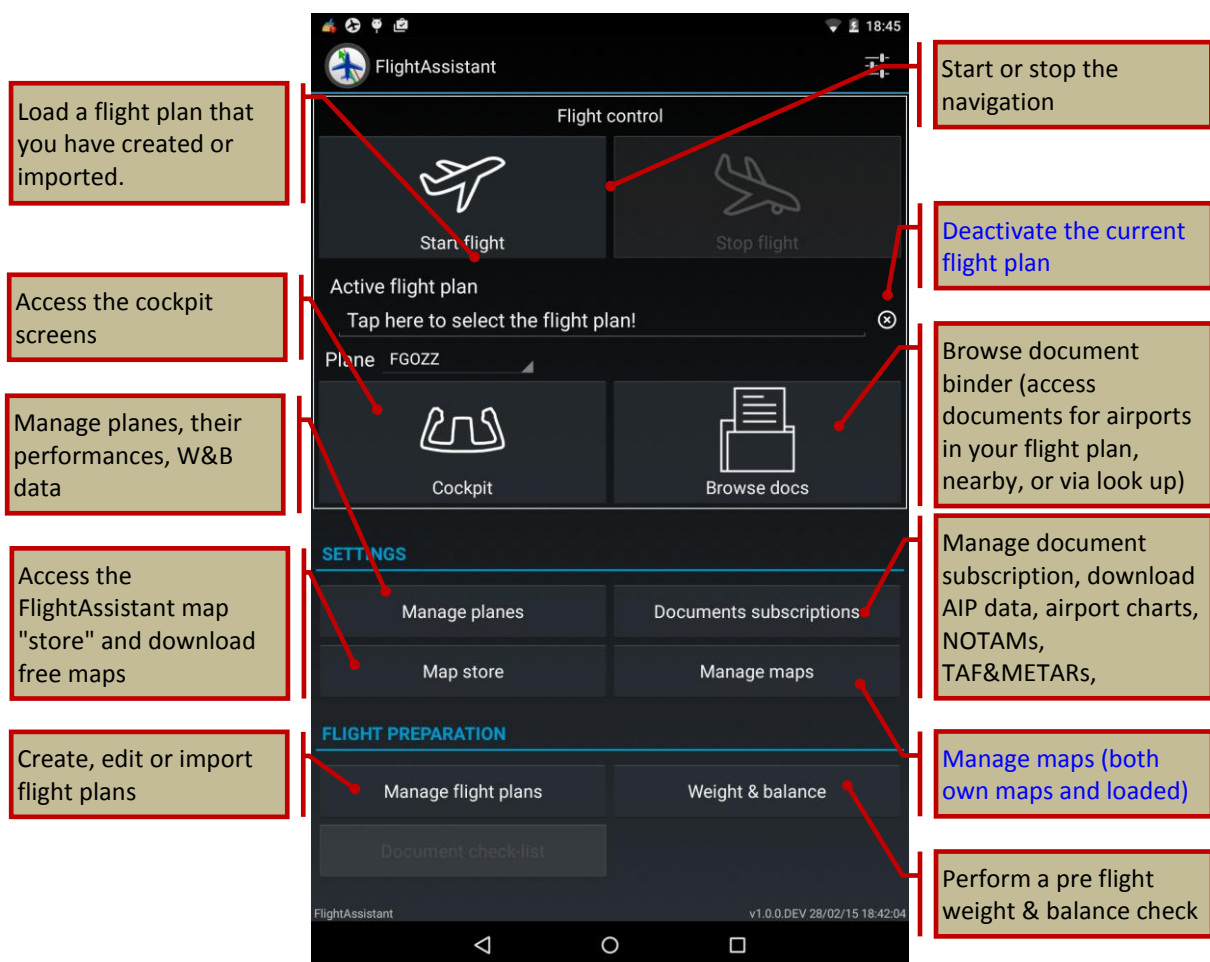
The "home page" allows controlling the core functions of FlightAssistant. This is here that you can start and stop the flight, manage or load a flight plan and access most settings.

You will also find on this screen an indicator of the GPS fix status.

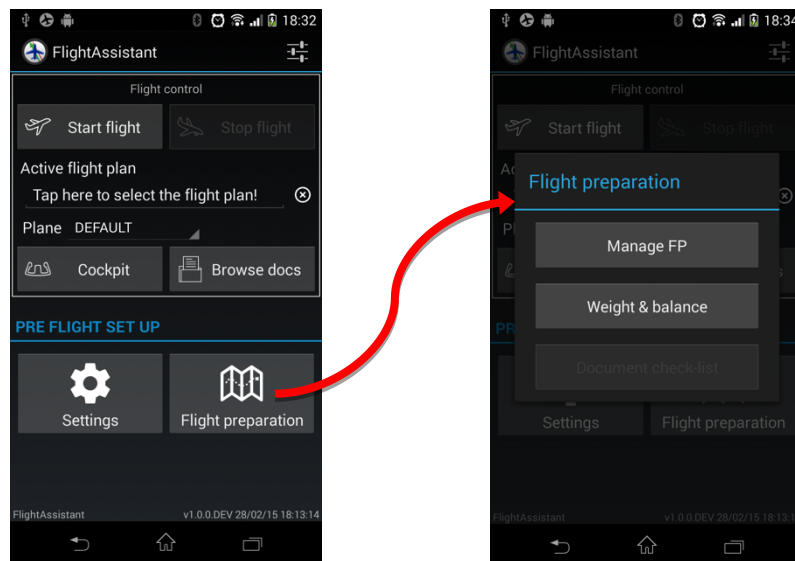
However, this screen is not tailored for use in flight.

The user interface

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The home page will look different on a phone where the screen estate is much smaller. The setting and flight preparation features are not directly visible and you will need to tap either the "Settings" or "Flight preparation" buttons to access each group of features.



As soon as you start a flight, the home page changes to display flight information rather than the settings and flight preparation sections.

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Starting and stopping the navigation

Before switching to the cockpit, it is better to start the navigation.

Starting the navigation means that FlightAssistant will start acquiring a GPS fix and will do what is relevant considering the current flight mode (is there a flight plan loaded, are in GOTO mode, etc.).

The GPS track is as well recorded (if this has been enabled in the [general settings](#)) from the moment the navigation is started (and until it stops).

The GPS tracks are recorded in the `/sdcard/flightassistant/tracks` directory as .gpx files.

The file will be named as `flight_plan-YYYYMMDD-hhmm.ext` with:

- `fligh-plan`: the name of the currently loaded flight plan or "Flight" or flight if no flight plan is loaded.
- `YYYYMMDD`: the date (YYYY = the year, MM, the month as 2 digits, DD the day as 2 digits).
- `hhmm`: the hour and minute the flight started.

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Loading a flight plan

To load a flight plan from the flight plan library and activate it, from the home page tap the "Active flight plan" field and select the flight plan.

The cockpit

User interface

The cockpit is made of a few pages that belong to a virtual ring.



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You can switch from one page to the other with swiping the current page to the left or to right with a fast(ish) horizontal gesture).

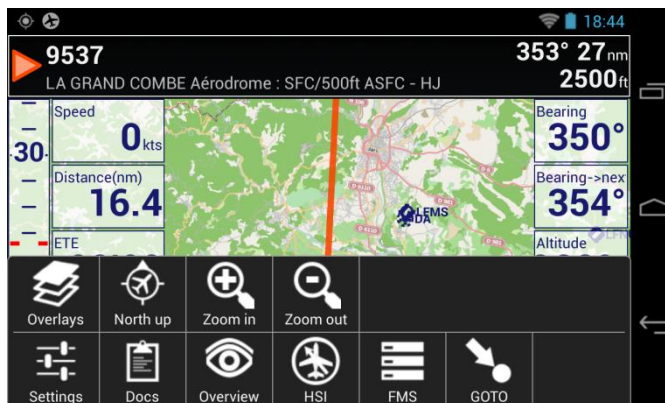
NB: there can be a small delay when you will first display the moving map.



➤ THE COCKPIT TOOL BAR

A contextual tool bar allows switching from one cockpit page to the other and gives access to contextual actions during the navigation.

The tool bar will "deploy" when you will press anywhere on the screen (or on the device's "MENU" key) and will automatically retract after a few seconds (or when you use an action). The action bar appears from the right of the screen when in portrait and from the bottom when in landscape.



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➤ THE "QUICK ACTION" BAR

There are a few actions that are relevant to the waypoints of the navigation (or destination in GOTO mode). Those actions will automatically appear in the quick action bar when you will press on one of these points (for example on a [to, from or next waypoint block](#), or on the [FMS](#))

The list of actions can vary based on the type of the point (airport, GPS point, etc.) and its relative rank in the flight plan.

The quick action bar allows:

- viewing airport documents (diagram, charts, etc.) if some are available;
- browsing the arrival briefing (NOTAMs, TAF, METAR, frequencies & runway information, ~~ATIS~~, ~~runway diagram~~);
- ~~enter ATIS information~~;
- change the cruise altitude or the arrival altitude of the branch;
- engage the "Direct To" mode.



➤ **ADDITIONAL DISPLAYS FOR TABLETS²**

Taking advantage of a more comfortable screen estate, some cockpit pages can offer alternative layouts arrangements with additional information that can be enabled in the settings of each page.

Those alternative layouts have the same main function (the alternative layouts of the moving map still display a moving map on most of the screen) but offer a secondary function? For example, you can display a "mini HIS" on the moving map page.

² Screen sizes qualified as "large" by the Android operating system, generally at least 5' x 3'.

The "overview" page

The overview page gathers most of the flight current data.

It is fairly reach but should only be considered as a "catch all" summary. Other pages offer a more synthetic view.

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The screenshot shows the overview page with the following callouts:

- In "flight plan", "GOTO" and "direct to" mode, origin of the current leg courante (the waypoint we are coming from).** Points to the **LFMT** (Montpellier Méditerranée) section.
- Current ground speed and ground track.** Points to the **Speed 0 kts** and **Bearing 11°** fields.
- Distance to the destination waypoint (of the leg, the GOTO).** Points to the **Distance 4.6 nm** field.
- Route towards the next waypoint. This is the bearing we should fly in order to joining the destination waypoint of the leg in a straight line.** Points to the **Bearing->next 58°** field.
- Deviation from the theoretical route (of the leg, the GOTO). If the deviation is positive the theoretical route is on our right side, if it is negative the route is on our left side.** Points to the **Course deviation 2.5 nm** field.
- Track defined in the flight plan for this leg.** Points to the **Course->next 24°** field.
- Estimated Time En route: remaining flight time to reach the destination waypoint (of the leg, the GOTO).** Points to the **ETE 02'17** field.
- Estimated Time of Arrival : estimated time of arrival to (or over) the destination waypoint (of the leg, the GOTO).** Points to the **ETA 21:14** field.
- Current leg block.** Points to the **LFMT/N Nord Ville de Sommières** section.

➤ THE CURRENT LEG BLOCK

This block exists in a few pages, but the information are always the same.

The diagram shows the current leg block with the following callouts:

- Description of the waypoint** points to **LFMT/N**.
- Name of the waypoint** points to **Nord Ville de So...**.
- Desired track of the leg (defined in the flight plan or when the GOTO mode was engaged)** points to **24° 14 nm**.
- Distance of the leg (from destination to origin).** points to **2500 ft**.
- "To" symbol.** points to the orange triangle icon.
- Cruise altitude** points to **1500 ft**.
- Arrival altitude.** points to **2500 ft**.
- Arrival altitude indicator (are we climbing or descending towards the arrival altitude).** points to the blue arrow icon.

A similar block exists for the next leg (the one after the current one). The "To" symbol is replaced by the "Next" symbol.

The moving map



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➤ ZOOM, SCAN AND ORIENT

In order to best use the screen estate, the zoom buttons are not displayed on a permanent basis. They are available in [the cockpit toolbar](#) that will appear if you press anywhere on the screen.

You can as well use the standard "pinch open" and "pinch close" gestures to zoom in or out.



To move the map center, just swipe with your finger.

After a few seconds (see The moving map preferences) without interaction, the map will center on the plane location again.

Finally, you can choose to display the map either "North up" or "track up". The later will show the map with the current bearing pointing up. In this case the plane symbol (current position) will show 2/3rd down in the view (instead of in the middle).

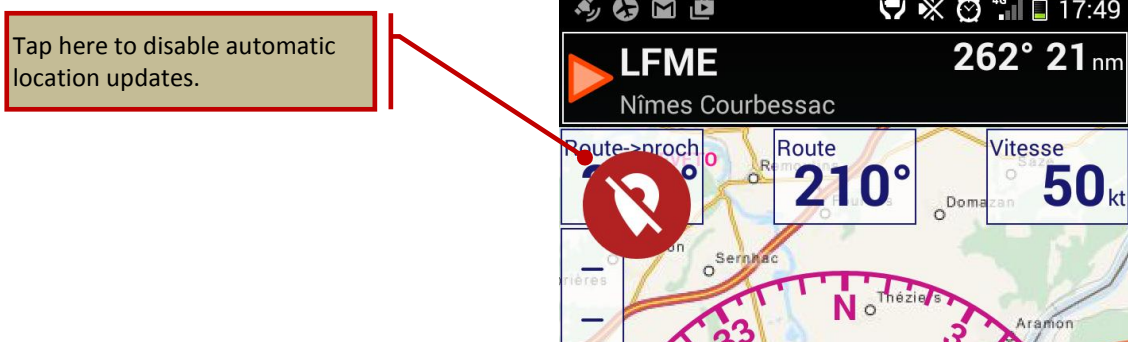


➤ LOCKING THE MAP

After manual scrolling, the map will center itself on the plane location again, unless you disable location updates.

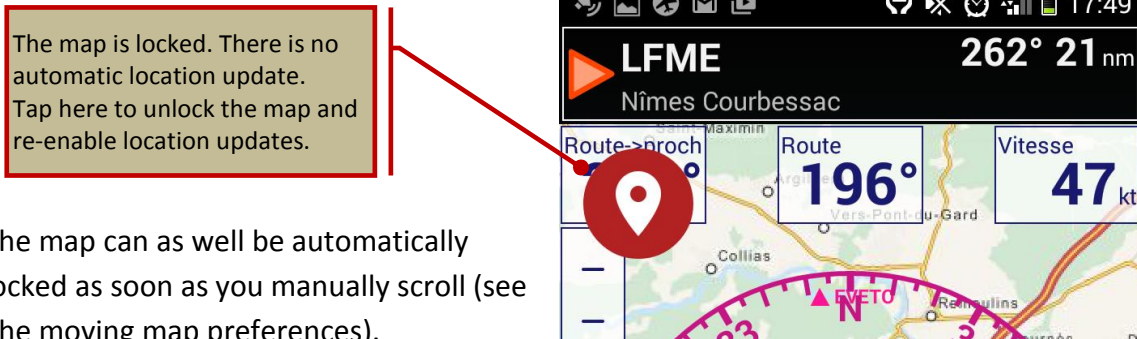
Once locked, you can continue to scroll, when you want the map (center) to follow your location again, just "unlock" the map.

When you scroll, the button to disable location updates the map appears for a few seconds. If you do nothing it will go away, if you tap it and disable the location updates, it will remain so that you can tap it again to unlock the map.



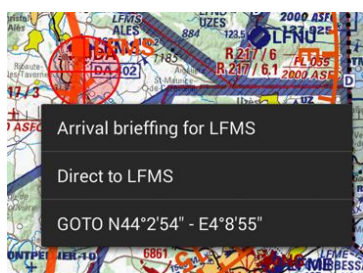
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Once the map is locked, the button changes and remains steady.



The map can as well be automatically locked as soon as you manually scroll (see The moving map preferences).

➤ CONTEXTUAL MENU

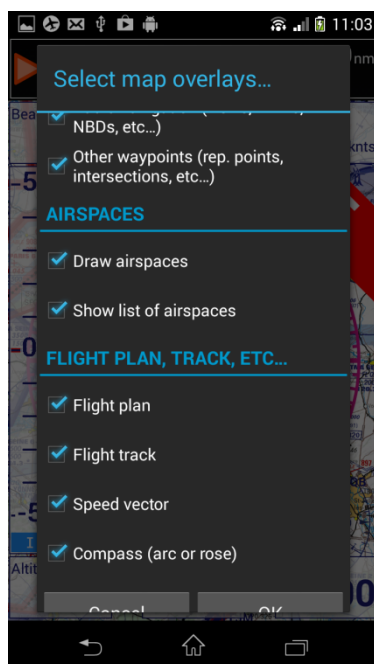


If you long press on the map, a contextual menu will display. Depending on what points are in the "snap" zone, you will be able to engage the GOTO mode (selected point), browse the arrival briefing (if you press close enough to an airport), go direct to a waypoint of your plan (if you press close enough to a waypoint of your flight plan).

➤ COMPASS

The moving can now display a compass overlaid on the map. Depending if you are in north up or track up mode, it will show either in rose or arc mode.

You can switch the compass on or off in the overlays management and you can set its size and color in the moving map preferences.



➤ OVERLAYS

The various elements that the moving map can display can be activated or deactivated in the overlays management.

This is here as well that you can select to hide or display your overlay maps (maps with partial cover, for example terminal charts) as they are considered as an overlay (see [Maps management](#)).

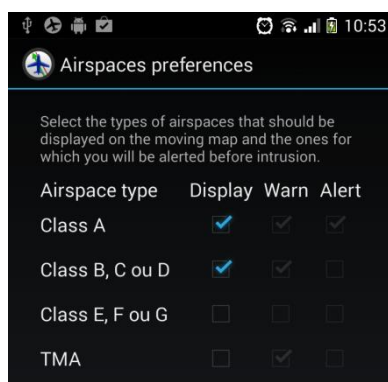
Please note that in order to maintain readability and performance, the number of points (airports, radio navigation, etc.) displayed on the map is limited to 200.

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➤ AIRSPACES

FlightAssistant can download airspaces and display them on the moving map. See [Managing AIP data](#) to learn how to download selected airspace data to your device.

On the moving map, there are 2 ways you can control how airspaces are displayed.



First, you can choose to display airspaces or not in the overlays manager (see [Overlays](#)). This will switch on or off the display **of all airspaces**.

Then you can fine tune what type of airspaces you want to display.









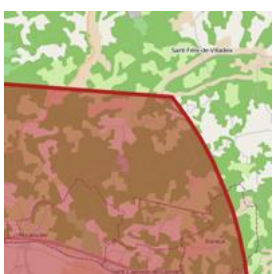

This can be done thru the map preferences, in the "Airspaces display & alert" section.

If you choose to display a given class of airspace, it will be displayed if the airspace overlay is

The "Warn" and "Alert" columns are used to set if you want to be warned and/or alerted when before entering this airspace type.

➤ AIRSPACES DISPLAY KEY

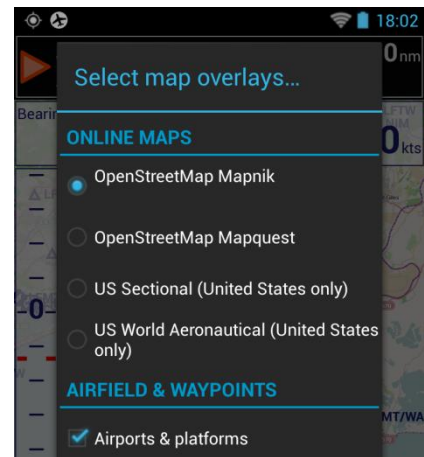
On the moving map, the airspaces are displayed as follows..

	Class A		Class B, C & D
	Class E, F & G		TMA
	CTR		TMZ
	Danger		Restricted
	<u>Prohibited</u>		FIR & UIR

➤ **ONLINE MAPS**

If you are using FlightAssistant **on the ground** before installing local maps, the application will use available online maps and will allow you to select the source.

Nonetheless, we **strongly** advise that you install at least one map locally in the application before using FlightAssistant in flight.



➤ THE MOVING MAP PREFERENCES

"Display" section	
Legacy layout	Select this if you want to use the legacy instrument layout as proposed in versions prior to version 1.0.5.
Speed vector length	Length of the speed vector in minutes of flight.
Moving map layout ³	Allows selecting what will be displayed alongside the moving map itself.
"Moving map colors" section ⁴	
Plane color	Color of the plane symbol
Speed vector color	Color of the speed vector. Please note that a light transparency effect will be added.
Track color	Color of the track. Please note that a light transparency effect will be added.
Flight plan color	Color of the flight plan. Please note that a light transparency effect will be added to the lines. The waypoints symbols and names will be opaque.
Compass color	Color of the compass (rose or arc mode).
GOTO route color	Color of the GOTO route. Please note that a light transparency effect will be added to the lines. The waypoints symbols and names will be opaque.
Airports & platforms color	Color of the airports & platforms points (from the AIP database).
Radio navigation points color	Color of radio-navigation waypoints (VORs, DMEs, NDBs, etc.).
Other points color	Couleur des autres points issus des données AIP (points de report, intersections, etc.).
"Moving map objects sizes" section ⁵	
Plane symbol size	Size of the symbol representing the plane location
Speed vector width	Width of the speed vector (affects size of "minute" bullets as well).
Track width	Width of the line representing the track
Flight plan size	Size of the flight plan (and GOTO or Direct To legs). This applies to the line width, the waypoint symbol sizes and their name).
Compass size	Size of the compass elements. This will affect line width, graduation height and text size.

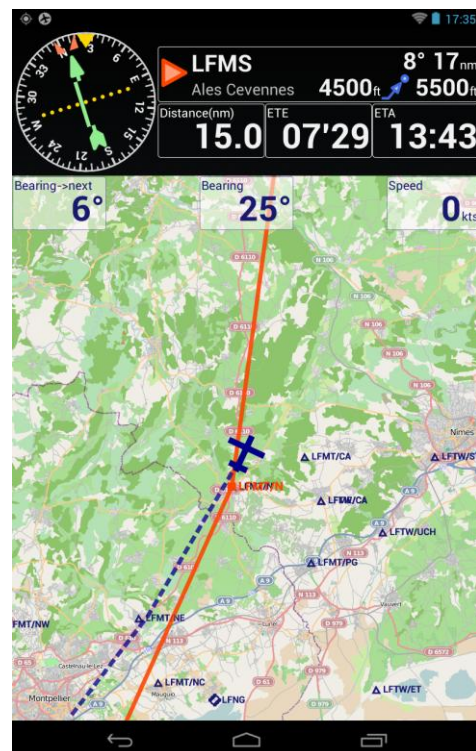
³ Only available on tablets⁴ Sub menu⁵ Sub menu, for each item you can choose "small", "medium" or "large".

Points size	Size of the AIP database points (affects the size of the symbols and of their name).
"Airspaces & alerte" section	
"Display" column	This type of airspace will be displayed on the map.
"Warn" column	You will receive a warning message before entering this type of airspace.
"Alert" column	You will receive an alert message before entering this type of airspace.
Moving map behaviour	
Auto-lock on scroll	When scrolling the map and "in flight" mode, this will automatically lock the map to the position you scrolled, stopping automatic updates to the current plane position. You'll have to re-enable location tracking manually.
Hold time after scroll	When the above is not activated, this will let you choose how long the map will pause before re-centering on the plane position after you manually scrolled to another position.

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➤ **ADDITIONAL DISPLAYS**

On a tablet, the preferences allow you to display a mini HIS as well as the moving map itself on the moving map page.



The HSI (Horizontal Situation Indicator)

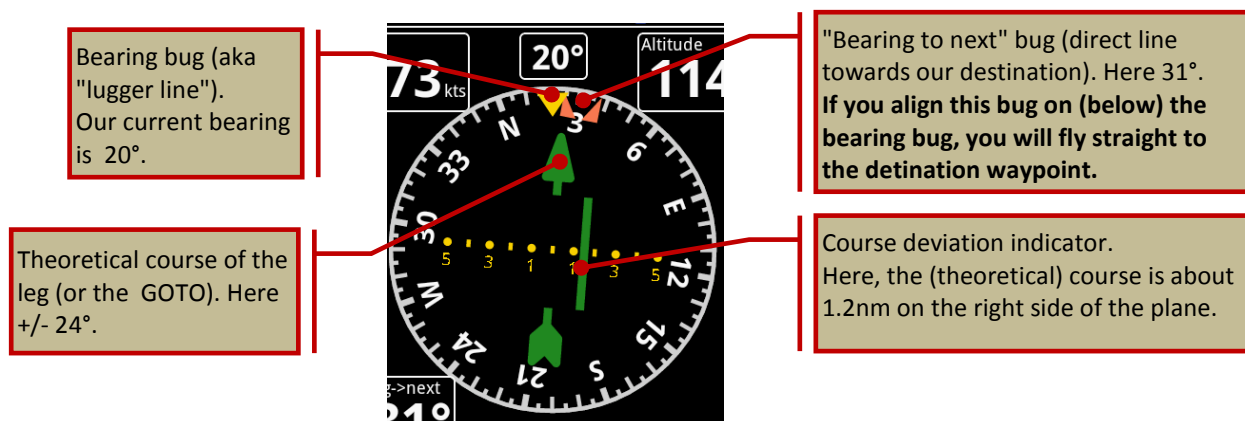


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➤ THE HSI (HORIZONTAL SITUATION INDICATOR) EN DETAILS

The HSI (the one in FlightAssistant or from your plane) will give you a both rich and concise indication on your current location relative to your theoretical route (as planned in the flight plan or when you started the GOTO /Direct to mode).

The main difference with a classic HSI in a plane that works with a VOR beacon, the one in FlightAssistant is coupled with the flight plan.



➤ THE HSI PREFERENCES

"HSI display" section	
HSI layout ⁶	Allows choosing additional elements that will feature on the page as well as the HSI.
Color of the heading bug	Allows choosing the color of the current heading indicator.
Color of the bearing-to-next bug	Allows choosing the color of the indicator that gives the direction to the next waypoint.
Course deviation indicator color	Allows choosing the color of the course arrow and course deviation indicator.
Graduation color	Selects the color of the deviation graduation color.

➤ ADDITIONAL DISPLAYS

On a tablet, you can enable the display of a mini FMS as well as the HSI itself.

In this case and in order to avoid duplicate information the "next leg" block as well and the remaining time and remaining distance displays are hidden.

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⁶ Only available on tablets

The FMS (Flight Management System)

The FMS page provides not only a view on the current navigation status but it shows as well what are the next legs, times, distances, etc..

Status of GPS reception. Can be hidden in the page preferences.

"Past" leg. The route and distance are from the theoretical flight plan. The estimated times are the theoretical ones as well.

Name, description and symbol (type of waypoint) of the destination of the leg

"Future" leg. The estimated time of arrival (ETA) is calculated in real time.

Name of the flight plan (if one was loaded).

Cruise altitude and arrival altitude (if provided & different).

Current leg.
WARNING: for this leg only, the route the route is the direct route towards the destination waypoint, the distance is the remaining distance to the destination and the ETE is the remaining flight time.

Waypoint	Symbol	Altitude	ETE	ETA
LFMT/N	Δ	4500 ft	06'50	08'33
LFMS	◊	4500 ft	03'05	08'50
Tvs Est La Grand Combe	×	5500 ft	05'39	08'56
Rivières + Ligne HT	×	5000 ft	07'16	09'03
LFHL	◊	5000 ft	06'49	09'10

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WARNING: if the GOTO or "direct to" mode has been engaged with a live flight plan, this flight plan will still show in the FMS, but the GOTO mode and its destination waypoint will be clearly indicated. The name of the flight plan is as well stroke through.

All the leg will appear like "future" legs.

You can choose to go back to the flight plan mode by pressing the "Resume FP" button.

The "GOTO >> XXXX" strip gives access to the quick action bar for "XXXX".



➤ CUMULATIVE DISTANCE AND TIME

The FMS can as well display cumulative information for distance and time (can be enabled thru FMS preferences).

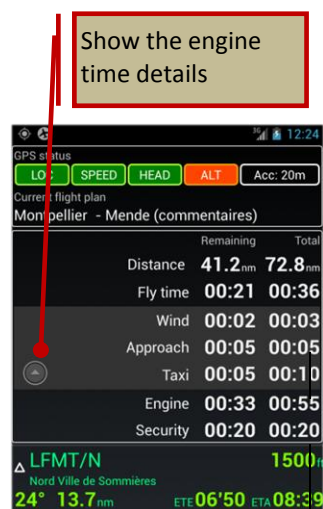
For each data FlightAssistant displays the total value for the whole flight and the remaining value (considering our current location):

- **Distance**
- **Flight time:** raw flight time to arrive over our final destination (this excludes approach, taxi, wind overhead and safety margin);
- **Engine time:** raw flight time + wind overhead + approach(es) + taxi time(s);
- **Security:** safety margin (**NOT INCLUDED IN ENGINE TIME**), it can be defined as a default or for the flight plan.

The detailed calculation of the "engine time" can be displayed:

- **Wind overhead:** a percentage of increase (~~that can be defined as a default or for the flight plan~~) is applied to the raw flight time (by default 10%);
- **Approach time:** additional time allowed to perform approach and landing (by default 5mn).
- **Taxi time:** additional time for taxi/ground manoeuvres, added once per take and once per landing (by default 10mn).

You can as well display the current plane performances in the FMS header.



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➤ ADDING COMMENTS TO THE FLIGHT PLAN LEGS

If you add comments to some legs in your flight plan, you will have to enable their display in the FMS preference pages.

A leg can have up to 3 lines of comment.

NB: in the case of a flight plan imported from Navigation (from F. Fouchet), you can define your comments in the comment field of each leg using the "|" (*pipe*) character as line separator.



➤ THE FMS PREFERENCES

"Display" section	
Show legs comments	Enable this if you want to display the comments associated with the legs of the flight plan (if there are some).
Show FP header	Shows the cumulative times and distances in the header section of the flight plan
➤ Show plane performances	This displays of the current plane performances (horizontal and vertical speeds) in the flight plan header
Show GPS status	Allows showing / hiding the GPS status block in the flight plan header.

GOTO and NEAREST

Just like any good aeronautical GPS, FlightAssistant sports a GOTO and a NEAREST feature.

They both engage the GOTO mode and only differ by the way they are activated.

➤ THE GOTO FEATURE

You can access the GOTO feature by pressing the "search" button of your device (provided it has one) or thru the GOTO button in the FlightAssistant tool bar.

If the navigation is engaged FlightAssistant knows where you are and will propose the points from the AIP database that are the closest to your current location.

You can then search for the point you are looking for by entering the first letters of its ICAO code or a part of its name (using your defined default keyboard). For each letter that you key in, the list of points is filtered again.

From the GOTO mode, you can switch to the NEAREST mode by pressing on the "NEAREST" button. The search field is then disabled and the list will display the nearest airports and airfields ordered by distance.

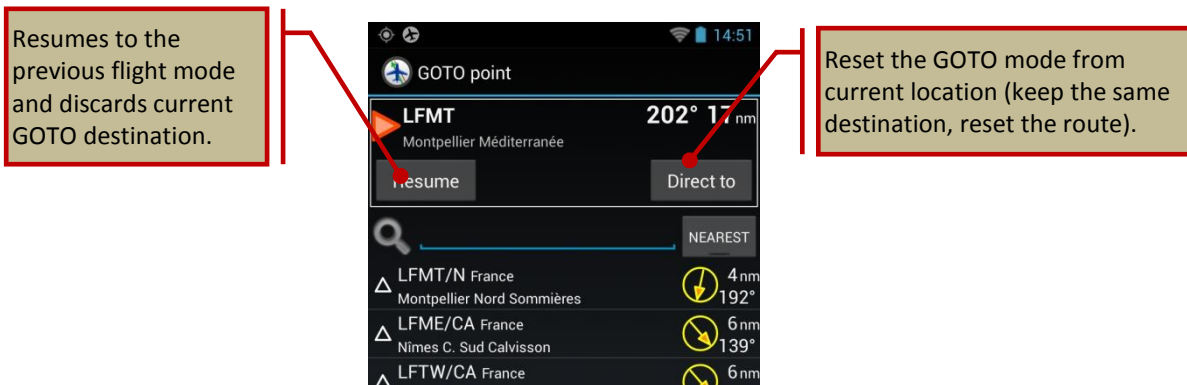
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The screenshot shows the 'GOTO point' interface. At the top, there's a search bar with 'LFM' entered. To the right of the search bar is a 'NEAREST' button. Below the search bar, a list of airports is displayed, each with a symbol, the ICAO code, the name, and the distance/direction. Annotations with red lines point to various elements:

- Filter the points with an ICAO code starting with "LFM" or a description containing "LFM"**: Points to the search bar containing 'LFM'.
- Switch to NEAREST mode**: Points to the 'NEAREST' button.
- Name, description and type symbol of the database point.**: Points to the first row of the list, 'LFMS Alès Cévennes Deaux'.
- Route and distance towards this point.**: Points to the distance and direction information for 'LFMT/N', showing '36 nm' and '171°'.
- Location indicator of the point (relative to our current location and course). Here the point is roughly à 6 o'clock, at 35nm.**: Points to the location indicator for 'LFMT/CA', showing a clock icon and '35 nm'.

Symbol	ICAO Code	Name	Distance	Direction
✈	LFMS	Alès Cévennes Deaux	20 nm	156°
△	LFMT/N	Montpellier Nord Sommières	36 nm	171°
△	LFMT/CA	Montpellier Nord Calvisson	35 nm	164°
△	LFME/CA	Nîmes C. Sud Calvisson	38 nm	164°
△	LFMT/PG		40 nm	

Once in GOTO mode, if you tap on the GOTO button again, the screen will look a bit different as it will propose two additional features: one to resume to the previous flight mode (either "free flight" or "flight plan" if a flight plan is loaded and active) and the other to reset the GOTO track from the current position.



➤ THE NEAREST FEATURE

The NEAREST feature is actually a variant of the GOT feature where you can only select a point from the closets airfields.

You can access the NEAREST feature by a long press on the "search" button of your device. If your device does not have a search button, your only option is to use the GOTO button in the tool bar and then switch to NEAREST mode using the "NEAREST" button... Yes, Google did this to us!⁷



⁷ Back in the Android 1.x and 2.x days, search buttons used to be mandatory on Android devices. This was dropped with HoneyComb...

The vertical navigation

When some altitudes are defined in the flight plan FlightAssistant will help you to fly accordingly (for each leg of a flight plan you can define a cruise altitude and an arrival altitude which is the expected altitude over the destination waypoint of the leg, see [Create a flight plan step by step](#)).

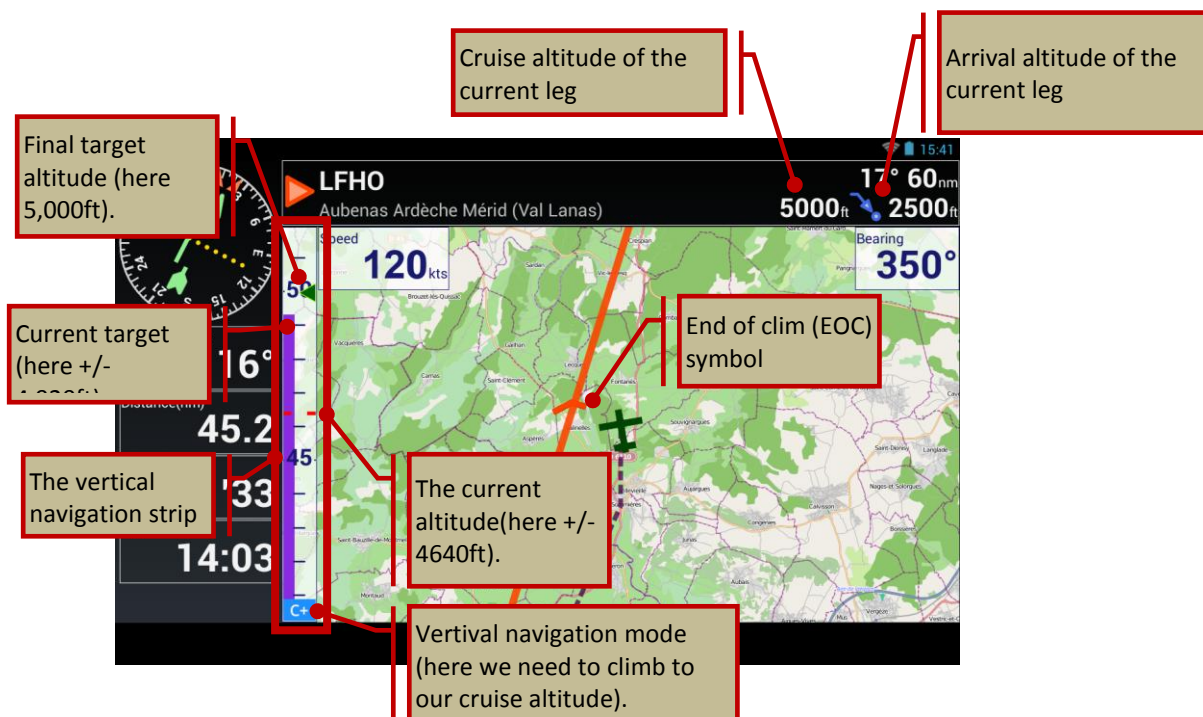
The vertical navigation is fairly simple and uses the performances defined for the currently selected plane (see [The planes management](#)). Its purpose is to give you back the following information:

- What is the current vertical navigation mode (for example "at cruise altitude", "climbing to cruise altitude", "descending towards arrival altitude");
- What is the final target altitude (cruise or arrival altitude);
- What is the current target altitude (considering the final target altitude and the performances of the plane). This should be our current altitude;
- If the final target altitude can be achieved (considering the plane performances).

The vertical navigation is as well graphically displayed as part of the flight plan on the moving map (in the cockpit page or the flight plan edition mode). The points of altitude change (start / end of climb / descent) will be drawn on the map.

NB : the cruise altitude is acquired at the beginning of the leg (the plane climbs/descends from the origin of the leg), the arrival altitude is acquired before reaching the destination waypoint (the plane climbs/descends in order to reach the arrival altitude just above the arrival waypoint).

➤ *THE VERTICAL NAVIGATION IN A NUTSHELL*



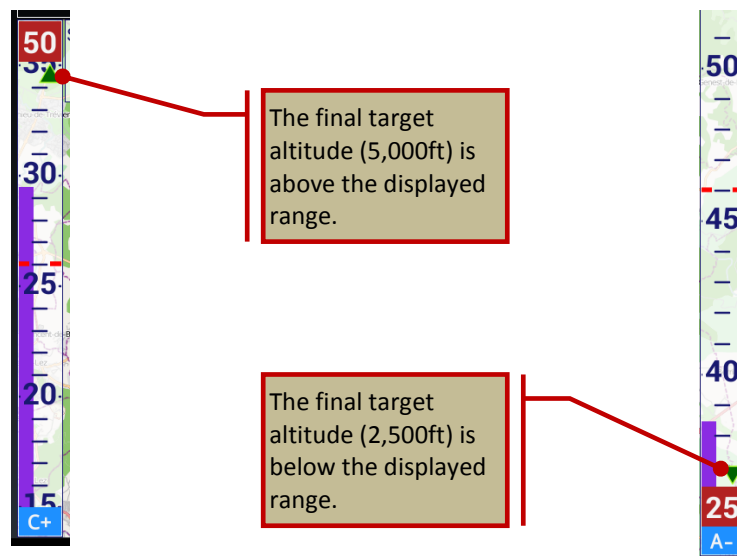
The possible vertical navigation modes are:

- I (Idle): the vertical navigation is not engaged, we are not trying to acquire any altitude, only the current altitude will be displayed;
- C+ / C-: acquiring cruise altitude by either climbing (C+) or descending (C-);
- C: at cruise altitude (+ or – 100ft from the cruise altitude) ;
- A+ / A-: acquiring arrival altitude by either climbing (C+) or descending (C-);
- A: at arrival altitude.

The vertical navigation strip (vNav strip) can display a range of either 1,000ft or 2,000ft (depending on the difference in current altitudes).

The vertical navigation strip can be displayed on the HSI page or on the "moving map" (see the preferences for each page).

It can happen that the final target altitude cannot be displayed (because of it is out of the displayed range). This will be made visible.



➤ VERTICAL NAVIGATION WARNINGS

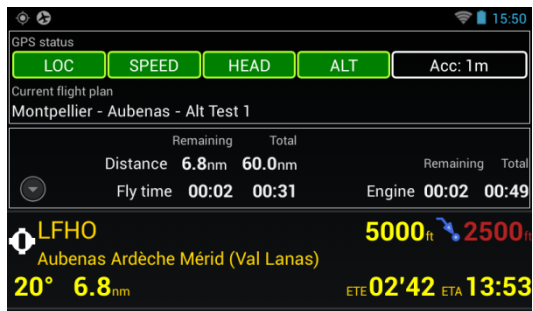
Whether it is in flight or when you are creating a flight plan, FlightAssistant can sometimes detect that an altitude constraint (cruise altitude or arrival altitude of a leg)



will not be met.

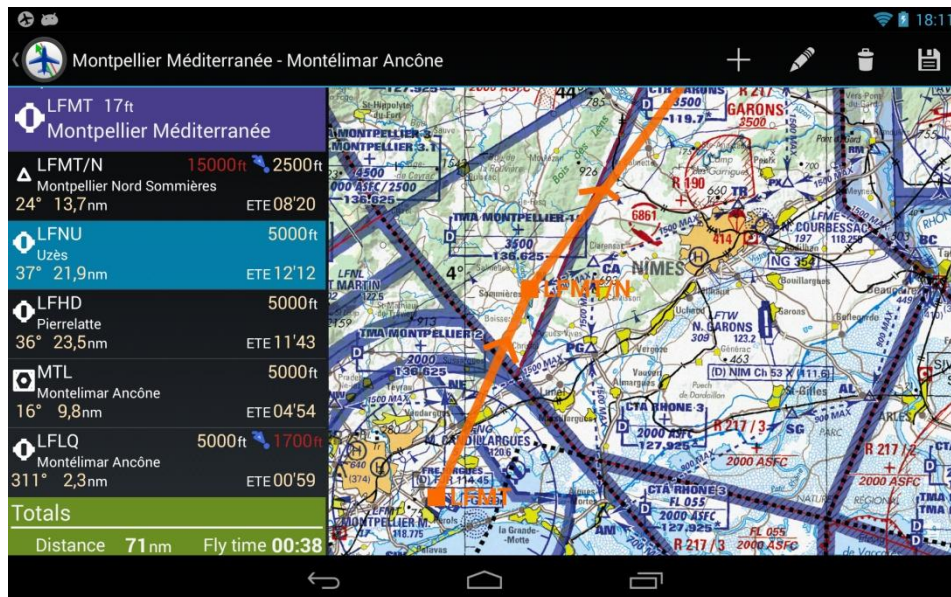
This altitude will be highlighted (red text) when it is displayed.

In this example we are flying at 4,600ft, 2'42" away from our destination waypoint where we should be at 2,500ft. Our plane a (defined) descent rate of 700ft/mn, therefore we cannot be at 2,500ft above our destination.



The warning is as well displayed in the "FMS".

The vertical navigation warnings display in the cockpit pages, but as well when editing the flight plan (if they exist at this time).



Two warnings are displayed in the above example:

- In the first leg (+/-14nm) we cannot reach a cruise altitude of 15,000ft and be at 2,500ft above the destination waypoint (possibly a typo?). It is to note that in such a case it is the arrival altitude that FlightAssistant will try to meet if at all possible. Here we will climb as much as possible (but we will not reach 15,000ft), then we will descend towards 2,500ft above LFMT/N ;
- In the last leg, it will not be possible to lose 3,300ft (from 5,000ft à 1,700ft) in 2.3nm.

In some situations FlightAssistant will calculate an "intermediate" overfly altitude. This is when you have specified an arrival altitude for a leg, but you need to start your descent/climb before the beginning of this leg.

In this example, we have defined a cruise altitude of 4,500ft and an arrival altitude of 2,400ft at LFHO.

But if we want to achieve this, we actually need to start our descent before AUB that we should overfly at 3,600ft (rounded). The cruise altitude for AUB – LFHO will be ignored.

△ LFMT/N	4500ft
Montpellier Nord Sommières	
24° 13.7nm	ETE 09'49
⦿ AUB	4500ft → 3600ft
Aubenas Ardèche	
17° 40.8nm	ETE 20'06
⦿ LFHO	4500ft → 2400ft
Aubenas Ardèche Mérid (Val Lanas)	
4° 5.8nm	ETE 02'30

Cross-pages features

The features that are described here can be available and accessed thru various cockpit pages.

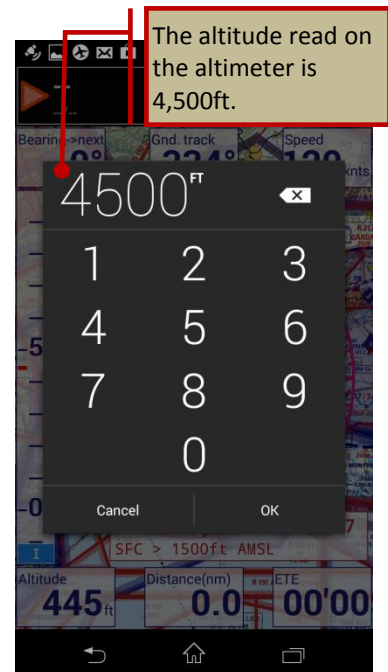
➤ MANUAL ALTITUDE CORRECTION

For many reasons, the GPS are not able to measure the altitude accurately and furthermore they do it based on a digital model of the earth that does not match everywhere the mean sea level reference that we usually use.

In order to overcome this issue, FlightAssistant allows you to define the "true"⁸ altitude that will be used to correct the GPS altitude.

You can define this altitude by pressing on any altitude gauge on any page of the cockpit.

Depending on the current location, phase of the flight and flight plan, FlightAssistant will propose you a default value that will be (hopefully) relevant (airfield altitude if you are taxiing, cruise altitude if there is one, defined, or truncated GPS altitude).



WARNING: do not use FlightAssistant as a primary source for the altitude information.

➤ AUTOMATIC ALTITUDE CORRECTION

In some situations, FlightAssistant will automatically adjust to the "true" altitude

If you are located less than 1.5nm away from an airport / airfield (ultra light airfield, helipad, etc.) that belongs to the AIP database, with a speed that is less than 20 knots, FlightAssistant will consider that you are at the apron or taxiing on this airfield and it will adjust your altitude to the value stored in the AIP database.

A message will warn you that altitude has been adjusted.

⁸ Altitude read on the altimeter of the plane at this time.

The document binder

The "document binder" gathers all the documents you might need to browse in flight.

The "Browse documents" button on the home page allows browsing your document binder, i.e. all the information and documents associated with an airport / airfield, via a look up (ICAO airfield code or description).

The various documents and information are gathered in tabs.

➤ ACCESSING DOCUMENTS IN FLIGHT

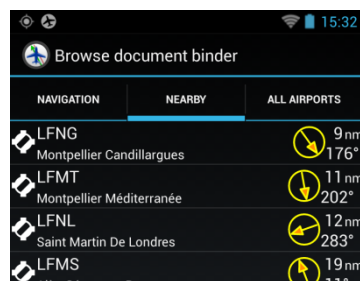
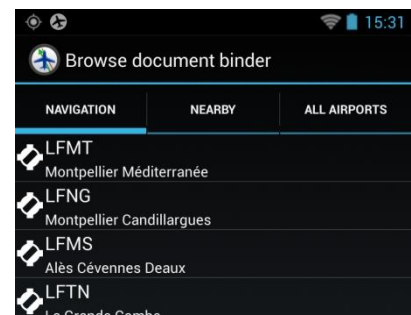
In flight (more accurately when the navigation is started), the "Document binder" menu (or icon) of each cockpit page and the control panel provides a quick access to the documents that are relevant at this time.

WARNING: once the navigation is started, the "Document binder" menu (or icon) does not lead to the management of the document binder, but to the browsing of information and documents.

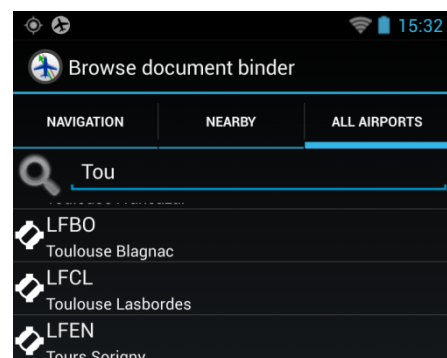
The "Navigation" tag displays the airfield/airports that are directly relevant to your navigation.

Those are the platforms that are less than a given distance either way of one of the flight plan legs. You can define this distance in the general application settings.

The airfields/airports are ordered the same way you will pass by.



The "Nearby" tab shows airports that are close to your current location (provided this location is known).



The "All airports" tab allows searching for an airport by its name or ICAO code in order to access to its documentation package.

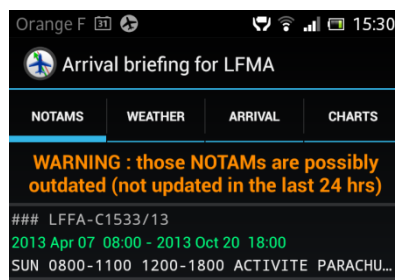


➤ THE NOTAMS

The "NOTAMS" tab holds the known NOTAMS for the selected airfield.

By default, only the first line of each NOTAM is displayed, just press in the NOTAM area to expand it (and retract it again).

If the NOTAMS for this platform were downloaded more than 24 hours ago, a warning message will display and will make you aware.



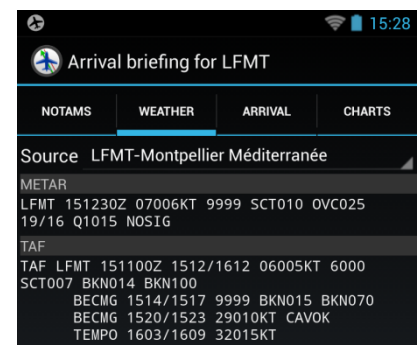
WARNING: only the NOTAMS for airports that are included in your AIP database can be downloaded and browsed later.

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➤ THE METEOROLOGICAL DATA (TAF AND METAR)

The "Weather" tab display TAFs and METARs for the selected airfield (if available) and for the 6 closest airports with meteorological data (those airports should be less than 100nm away from the selected airfield).

WARNING: a message will be displayed if the weather information was downloaded more than 6 hours ago (as there is a risk they are out-dated).



➤ THE ARRIVAL DATA

The "Arrival" tab gathers the known information for radio communication frequencies and runways for the selected airport.

This data comes from the AID community data that we have compiled from various sources. Their accuracy (and "comprehensiveness") can vary from one platform to the other.

If you spot an error or wish to improve the data, please do this directly in the data sources we are using ([OurAiports](#) and [OpenAIP](#)).

When those data are available, the tab will display the following information for the radio frequencies:

- The type of frequency (AFIS, ATIS, TWR, FIS, etc.),
- The frequency itself,
- A miscellaneous description.

For the runways, we can have:

- Its width and length,
- ~~The type of surface (pavement, grass, etc),~~
- The magnetic direction for each side (QFU),
- The threshold elevation,
- The *TODA* (Take Off Distance Available),
- The *LDA* (Landing Distance Available),
- The threshold displacement value.

Arrival briefing for LFMT	
NOTAMS	WEATHER
ARRIVAL	CHARTS
RUNWAYS	
12L/30R	2599 x 49m
12L	124° 17ft.
30R	304° 6ft.
12R/30L	1100 x 29m
12R	124° 10ft.
Disp. thres.: 99m	
30L	304° 7ft.
FREQUENCIES	
ILS	108.550
RWY 31R FG	
APP	133.775
MONTPELLIER Approche	
APP	130.850
MONTPELLIER Approche	
ATIS	124.125
TWR	118.775
TWR Secteur Nord	
TWR	118.200
TWR Secteur Sud	

➤ THE AIRPORT CHARTS⁹

This tab gives access to the available charts and diagrams for the platform.

If you have not updated your maps since the last AIRAC cycle, a warning will remind you that the documents might be out of date.

This tab will show as well the user documents that you might have loaded yourself into your device.

⁹ The airport maps or diagrams are not available for all countries

The document subscriptions

The document binder gathers all the documents that you might use during your flights and the associated management features.

It can contain:

- Some airport charts, airport diagram or airport plates;
- The weather information (TAF & METAR);
- The NOTAMs.

You need to "feel" your document binder before you can use it in flight and preferably when you have an unlimited Wifi connexion to the Internet.

The airport documents are loaded for a list of airports that you can define (either all airports from your AIP database or based on a distance from your flight plans).

The NOTAMs are loaded for a list of FIRs (Flight Information Regions) that you select.

The weather information is loaded for all the airports in your AIP database.

To manage your document binder, tap the "Documents subscriptions" button from the home page (you need to tap the "Settings" button first if you are on a phone).

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Managing AIP data

FlightAssistant maintains a local database with the relevant AIP data.

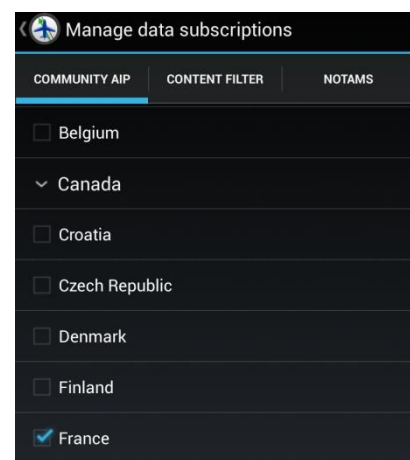
This database is built based on subscriptions that you will have to define ("Data subscription" section, tap "Edit").

They are 4 kinds of subscriptions:

❖ The geographical subscription:

It allows you defining the country (or country + region) for which you want the AIP data to be downloaded in the application.

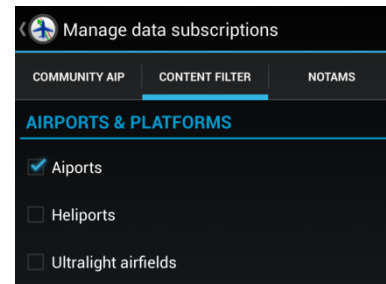
All the points (see below) of the defined area will be copied locally and will be available in flight or for flight preparation (flight plans).



The type of points:

You can filter what types of (aeronautical) points you want to import to your device.

For example, you might not want to import ultra light airfields and helipads if you only fly a plane.



❖ ~~The types of airport documents~~

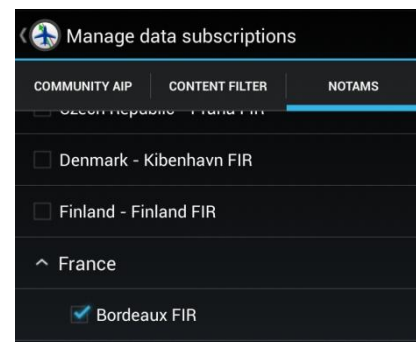
~~For the airports / airfield selected based on the above, FlightAssistant can download charts and diagrams in order for you to access them in flight.~~

~~This filter allows you to select what charts & diagram (from the available types) you want to copy to your device.~~

~~NB: not all documents are available in all countries.~~

❖ The NOTAMs

FlightAssistant download the NOTAMs based on FIRs. You need to define in what FIRs you are likely to fly so that FlightAssistant can download the corresponding NOTAMs.



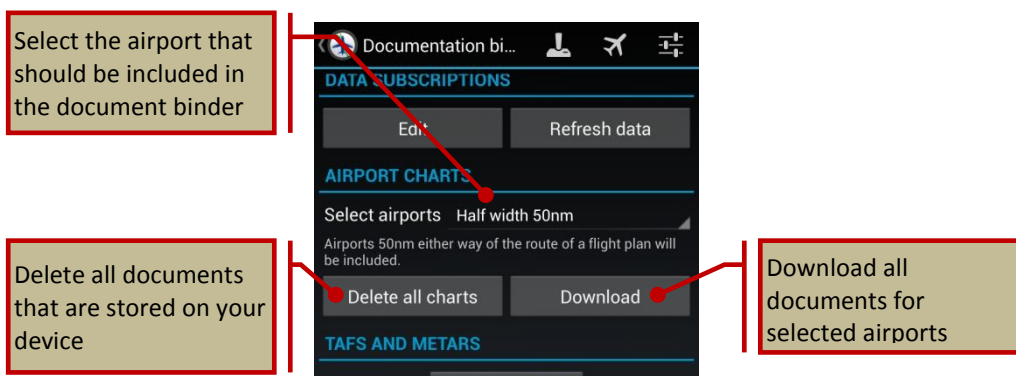
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Selecting and downloading airport documents

The list of airports included in your document binder is built automatically before each download.

You can choose to include all airports from your AIP database at this time.

Alternatively you can select only the airports that belongs to your (current) flight plans or that are within 10, 20, 50 or 100 nautical miles from a leg of a flight plan.



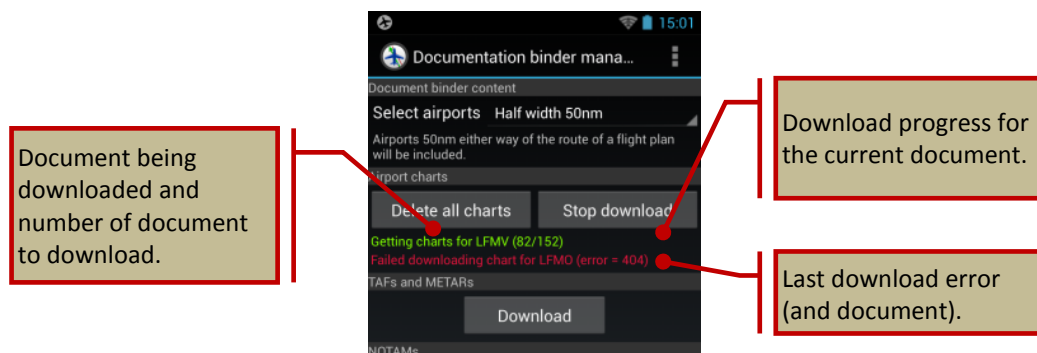
➤ DOWNLOADING AIRPORT DOCUMENTS

FlightAssistant will automatically select the source of the document based on the country and the type of document¹⁰.

Depending on how many airports there are in your document binder, the download can last some time.

FlightAssistant will only download the documents when it is necessary (either it's new in the document binder and was never downloaded, or it has not been updated since the beginning of the current AIRAC¹¹ cycle).

If you want to start a new full download you need to first delete all the documents (button "Delete all charts").



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You can stop the download process at any time, it will stop at the end of the current document. When you will start a download session again, FlightAssistant will resume where it last stopped.

➤ DOWNLOADING TAFs AND METARs

The TAFs and METARs are downloaded for all the airports in your AIP database.

The download goes thru 4 phases, one download and one processing phase for TAFs and for METARs¹².

WARNING: each file "weights" between 1.5 and 2 megabytes, we recommend to update this information when a Wifi Internet connection is available.

¹⁰ FlightAssistant is currently limited to the VAC charts for French airports and airport diagrams from the FAA for the USA.

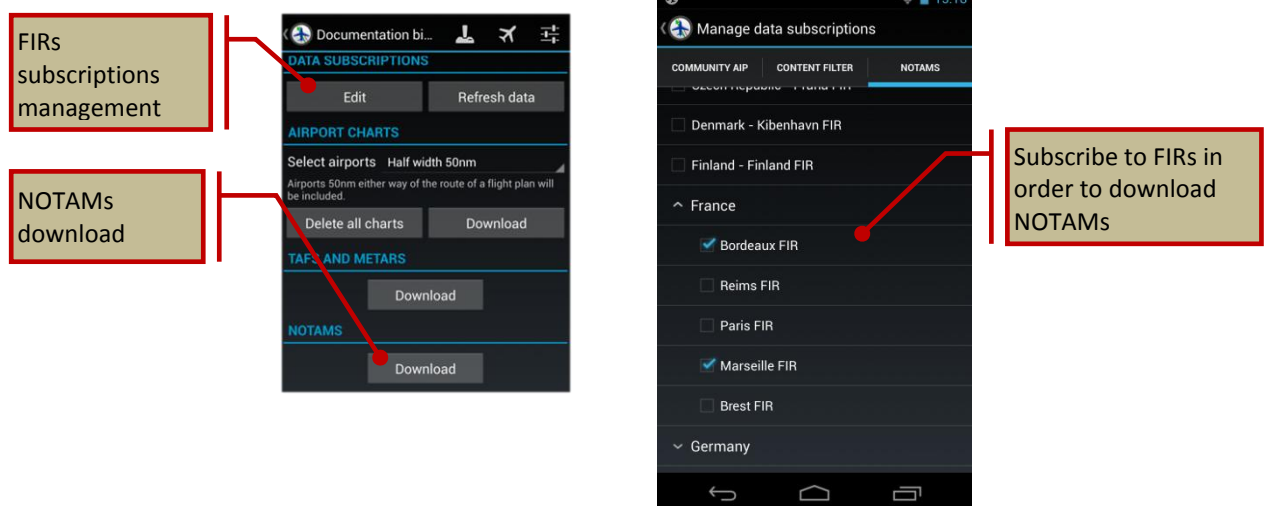
¹¹ The AIRAC cycles are the official update cycles for aeronautical information update. They are defined by ICAO (see [Eurocontrol's website](#)).

¹² The weather data is downloaded from the USA's [National Weather Service](#). A full cycle file is downloaded for [METARs](#) and [TAFs](#).

FlightAssistant consider that the weather information is "current" for 6 hours. After this delay, a warning will be displayed if you use out-dated information.

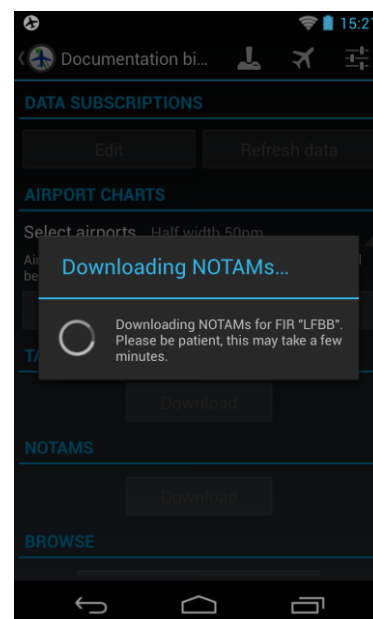
Selecting and downloading NOTAMs

FlightAssistant downloads NOTAMs¹³ based on a list of FIRs (Flight Information Regions) to which you will subscribe (see [Managing AIP data](#)).



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The NOTAMs are downloaded FIR by FIR. The NOTAMs are selected based on activation time (from "now" and to 48 hours in the future), VFR flight rules, including GPS NOTAMs.



¹³ The NOTAMs are downloaded from the French [Service de l'Information Aéronautique](#) (DGAC, French aeronautical authority).

User documents

FlightAssistant allows you to add your own documents to airports so that they can be displayed in the arrival briefing for the given airports.

To achieve this, you just need to follow the naming convention below and store your files in the "user_documents" folder in the FlightAssistant main directory (generally `/sdcard/flightassistant`).

At the moment, only files with extensions PDF are supported.

Name schema	Type of file
CHART_VAC_XYZ.ext	Visual Approach Chart for XYZ
AIRP_DIAG_XYZ.ext	Airport Diagram for XYZ
CHART_IAC_XYZ.ext	Instrument approach plate for XYZ
CHART_SID_XYZ_name of SID.ext	Standard Instrument Departure named "name of SID" for XYZ
CHART_STAR_XYZ_name of STAR.ext	Standard Terminal Arrival Route named "name of STAR" for XYZ
MISC_XYZ_Document name.ext	Other document named "Document name" for XYZ.

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The preferences of the document binder

Preference	Action
Download via Wifi only	If this option is enabled, the "large" downloads (documents, charts, diagrams, etc.) will only be enabled if a Wifi connection is available (they will not be enabled if only a 3G connection can be used). This does not affect the download of the more "transient" data like NOTAMs or TAFs and METARs that can be downloaded as long as there is a connection).
Half width	This defines the airports that will be included in the "Navigation" tab when browsing the document binder (with a loaded flight plan). This is a distance from one of the legs of the flight plan.

The Map Store

Though it does only contain free maps, the place where you can download and install maps from the FlightAssistant servers is called the map store.

To access the map store, tap the "Map store" button in the settings section of the home page, if you are using a phone tap the "Settings" button first.

The map store presents the maps catalogue grouped by region (large country, continent) and splits the maps into chunks small enough to be downloaded easily.

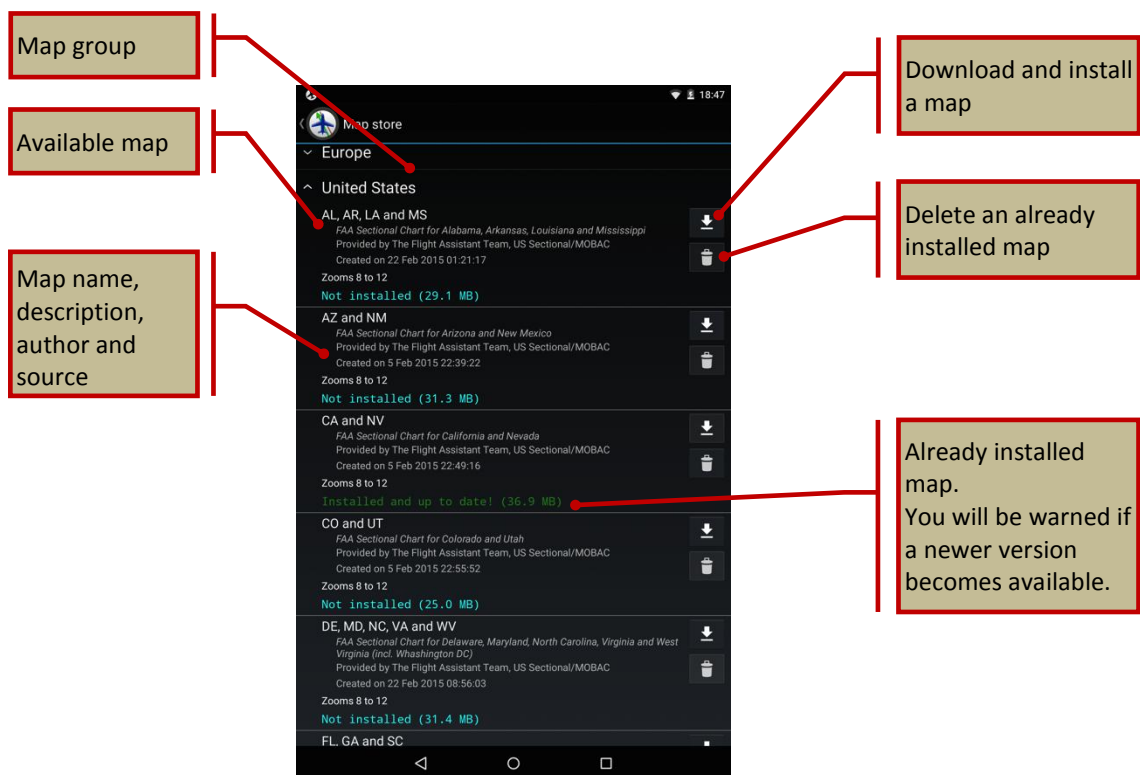
For each available map, FlightAssistant will give a short description, the coverage and source of the map as well as the zoom level available.

When you tap the download button on a map, a two phases process happens. The map is first downloaded and it is then post processed and installed on your device.

The whole process should not be longer than 1 or 2 minutes unless you have a very slow Internet connection. You will see the status changes throughout the operations.

You can download more than one map at a time.

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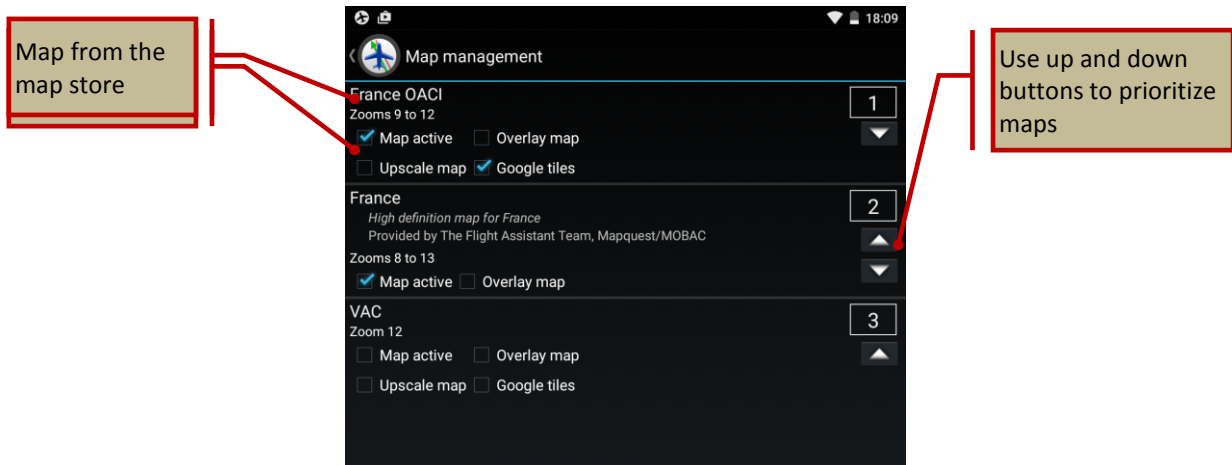
Once you have installed maps from the map store, you can organize them thru the "Manage maps" page.

You can mix FlightAssistant maps with your own maps (see "Creating your own maps" below).

The manage maps screen allows you to define the settings of the maps you have created and organise them amongst the FlightAssistant maps.

You will be able to activate or deactivate a map, define if it is made of Google tiles or TMS tiles and if it should be upscaled.

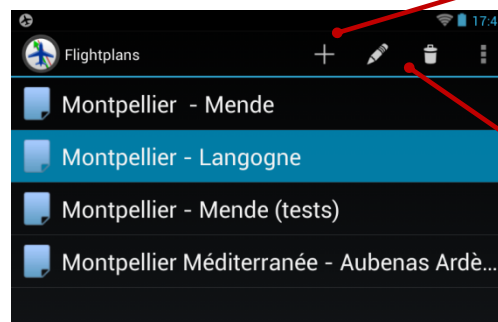
The two last settings only apply to user created maps, you do not have to worry about that for FlightAssistant maps.



Managing flight plans

Create/edit/delete a flight plan

From the control panel, press "Manage FP".



Add a flight plan

Edit or delete the selected flight plan
NB : on small screen, the delete button can be in the overflow menu.

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Once you are editing the flight plan, you have access to the navigation log¹⁴ (the list of legs in the flight plan).

Add a leg after the current one

Edit the selected leg

Flight departure

Destination of this leg

Route and length of the leg

Access to contextual menu

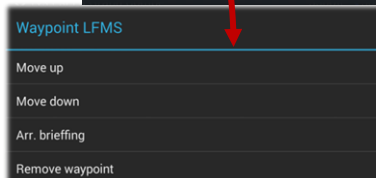
Misc. features (rename the flight plan, etc.)

Revert the flight plan

Switch to map view

Cruise altitude and (possibly) arrival altitude with change indicator

Estimated time en route for the leg

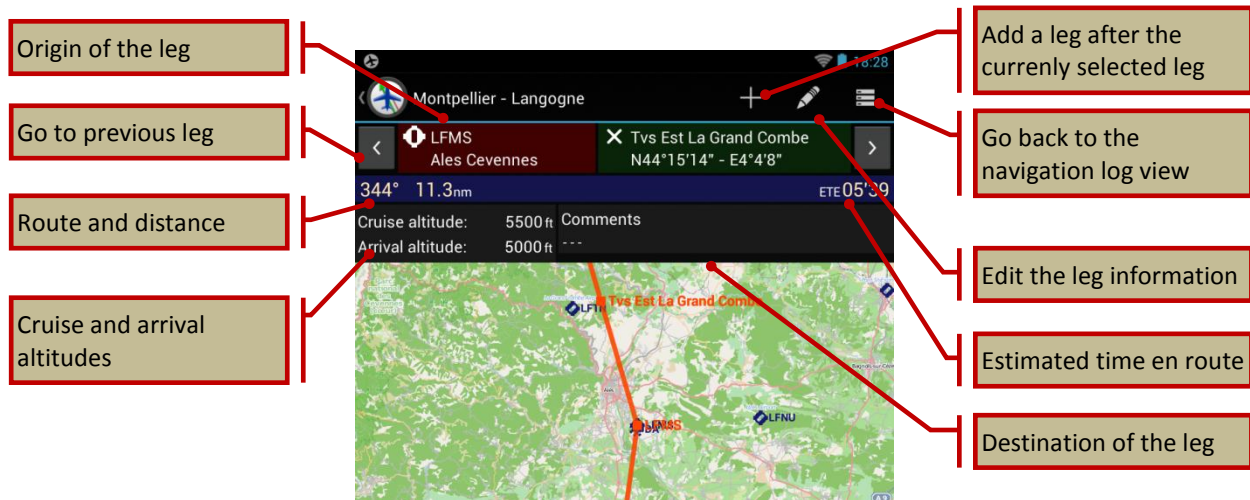


Total distance and flight time for the flight plan.

Montpellier - Langogne			
Departure	LFMT 0ft		
Montpellier Méditerranée			
LFMT/N	Nord Ville de Sommières	4500ft	
24° 13,7nm		ETE 09:50	
LFMS	Ales Cevennes	4500ft	5500ft
8° 17,0nm		ETE 09:11	
X Tvs Est La Grand Combe	N44°15'14" - E4°4'8"	5500ft	5000ft
344° 11,3nm		ETE 05:34	
X Rivières + Ligne HT	N44°29'12" - E3°58'28"	5000ft	
344° 14,5nm		ETE 07:16	
LFMG	Langogne Esperon	5000ft	4800ft
344° 13,7nm		ETE 06:47	
Totals			
Distance 70nm		Fly time 00:38	
App. & taxi 00:25		Wind 00:03	
		Engine 01:07	

¹⁴ On devices with an Android system prior to 3.0, the actions are available thru a long press on the leg

On the map view, the flight plan is displayed "graphically" with the maps as background, the information for the currently selected leg are visible.



When you edit a leg of the flight plan, you might not be able to change the name and the description of the destination point (only "GPS" points can be renamed, points from the AIP database cannot).

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FlightAssistant will make it easy to edit the altitude as it will "propagate" your changes to the next legs.

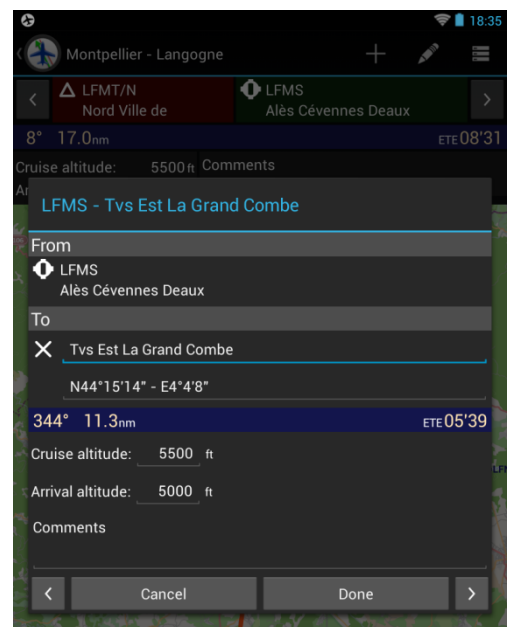
For example, if you define a cruise altitude of 2,500ft on the first leg, it will apply as well to all the following legs (provided they had to cruise altitude defined).

This propagation has its own logic and it will stop when there is a risk to create some inconsistency. For example, the legs #1 to #4 have a cruise altitude of 2,500ft, #5 and #6 have 3,500ft. If you edit leg #2 and change it to 3,000ft, the legs #3 and #4 will be changed to 3,000ft as well, but not leg #5 (because it did not have the same cruise altitude that leg #2 before change).

If you define an arrival altitude on a leg, this altitude will be propagated as cruise altitude from the next leg.

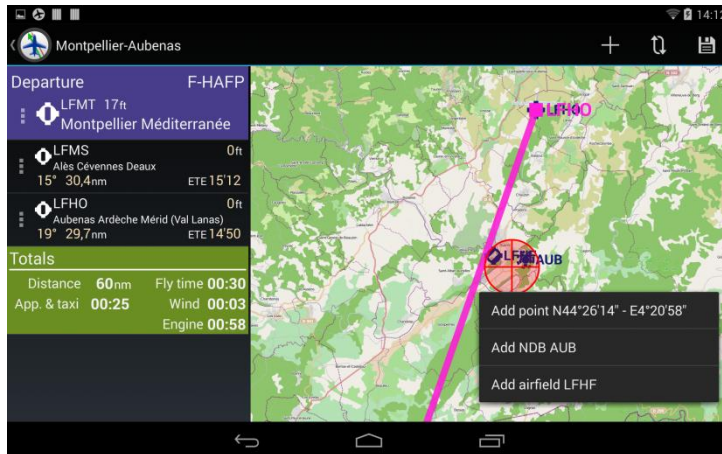
You can define up to 3 lines of comment that will display on the FMS page (if this feature is enabled in [the FMS settings](#)).

The "<" and ">" buttons at the bottom of the screen will switch to the previous or next leg without quitting the "edition" mode.



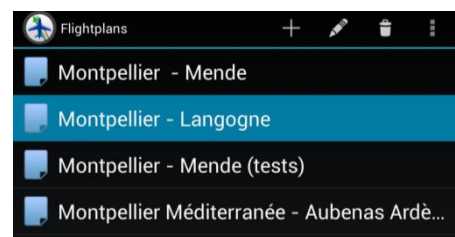
On the map view, you can add points with a long press.

If some AIP points (airports, radio navigation beacon, etc.) are in the "snap zone" (the red circle), FlightAssistant will propose to add them as well as the GPS point strictly defined by the coordinates where you pressed.

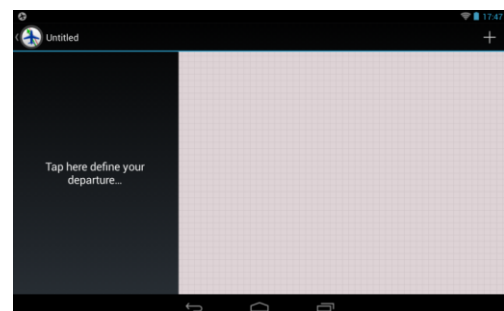


➤ CREATE A FLIGHT PLAN STEP BY STEP

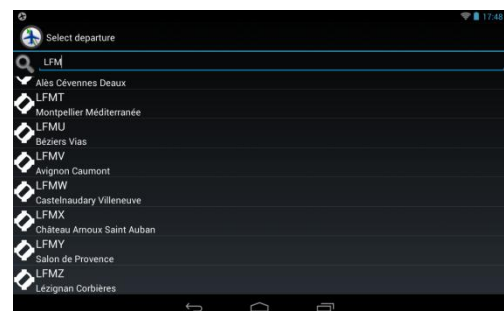
From the flight plan list (control panel → Manage FP) press the "+" button in the action bar.



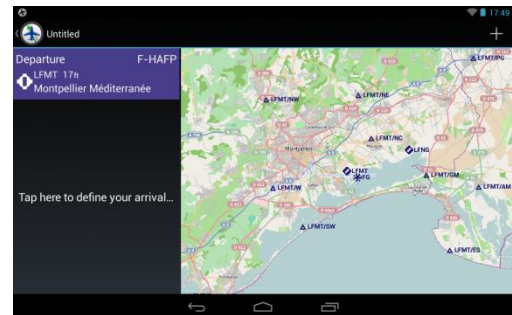
You first need to define your departure.



You can look up for an airfield / airport in the AIP database using its name or ICAO code.



The departure is displayed in the header of the flight plan and you now need to define your destination

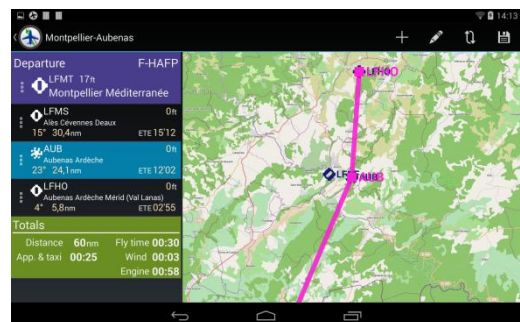


Define the destination of the flight just as you did for the departure.


As soon as you have chosen your destination, FlightAssistant will require you to name your flight plan in order to save it. A name is automatically generated based on departure and arrival airfield names but it can be changed.




You will then switch automatically to the flight plan edition mode and you can add points ("+" button for a look up in the database or long press on the map), you can set / change the altitudes or the name of GPS points.



➤ **RENAME A FLIGHT PLAN**

To rename a flight plan, proceed as if you were editing it (select it in the list, press the edit button) then use the  button or the "Save FP as..." menu to change its name.

➤ **DELETE A FLIGHT PLAN**

On the flight plan management screen, use the  button or the "Delete" menu. You will be asked to confirm the deletion.

Importing a flight plan

FlightAssistant can import .nav files from [François Fouchet's Navigation application](#) that is quite famous in France, or .gpx files from your preferred planning application (provided it has an export facility).

To do the import, just copy the file to your device's storage, then go to the flight plan management (control panel → Manage FP) and choose "Import FP" from the menu and select your file.

It will be imported, saved as a FlightAssistant flight plan in the internal library and loaded ready for you to fly.

Miscellaneous features

When editing a flight plan, if you touch or swipe the map some additional buttons will appear at the bottom of the screen.

On top of the obvious zoom controls, they will allow you to select the layers visible on the map (points, zones, etc.) and will help you locating a point (search for a point and center the map on it).

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Search for a point and center the map on it



Select visible layers

Zoom controls

Weight & balance and plane management

Weight & balance is tightly linked to plane definition and management, hence both features will be covered in this section.

Please, bear in mind that if you expect accurate weight & balance calculations as well as accurate ETEs and ETAs forecasts, it is important that you define your planes as accurately as possible.

Plane management

Access: In the settings section, tap Manage planes (or tap the Settings button first)

The list of planes is empty by default. You can add a plane by tapping the "plus" button in the action bar.

Once the plane list will be populated, you will be able to add, edit or delete planes.

The plane management screen is split in four different tabs.

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➤ PLANE SPECIFICATIONS

In the plane specification tab you will be able to define the basic identification of the plane (or other preferred “flying vehicle” ;) as well as (more importantly) its units.

Those units will be used thereafter to define all of the other information for the plane.

Do not worry too much though, you can change your mind and modify the unit later, all relevant information will be converted (i.e. if you chose “Liters” as fuel units and entered tank capacity in liters, when you change the plane fuel unit to “US Gallons”, the tank capacity will be updated to reflect the new unit.

FlightAssistant

SAVE CANCEL

SPECIFICATIONS PERFORMANCES WEIGHT DETAILS C.G. LIMITS

IDENTIFICATION

Call sign **FJMCO**

Manufacturer Robin

Model DR488

UNITS

Speed Knots

Vertical speed ft/mn

Moment (W&B) kg x m

Fuel Liters

➤ PLANE PERFORMANCES



FlightAssistant

SPECIFICATIONS PERFORMANCES WEIGHT DETAILS

PERFORMANCES

Cruise speed 110 kt

Climb speed 85 kt

Descent speed 130 kt

Climb rate 500 ft/min

Descent rate 500 ft/min

FUEL

Fuel type Avgas 100LL

Avg. fuel flow 35.0 l/h.

Plane performances are used for flight planning and therefore should be as accurate as possible, both for horizontal speed (speed between point A and point B) and vertical speed (speed for changing from altitude X to altitude Y).

You will define as well on this tab the type of fuel and average fuel consumption (per hour) that will be used for weight & balance calculations.

All values are to be entered using the plane unit previously defined.

➤ WEIGHT DETAILS

As you would expect, the weight & balance calculation will heavily rely on weight details for the plane.

Beyond defining MTOW (maximum take-off weight) and MLW (maximum landing weight), you will define as well the “weight stations” for the plane.

Weight stations model all items that can carry load at the time of flying:

- The plane itself;
- The pilot (or pilots);
- The passenger (or passengers);
- The fuel tanks;
- The luggage compartments;
- Other load points.

For each weight station, you will need to define the arm and optionally the maximum weight that will limit the weight you can enter at calculation time.

Only enter a value if the plane actually has a structural limit, **if you enter 0, the limit will be ignored.**

If this is a fuel tank, you will rather be asked to enter the maximum capacity (how much fuel the tank can contain) and the unusable fuel quantity.



FlightAssistant

SPECIFICATIONS PERFORMANCES WEIGHT DETAILS C.G. LIMITS

MAXIMUM WEIGHTS

Max. takeoff weight (MTOW) 1100 kg

Max. landing weight (MLW) 1045 kg

WEIGHT STATIONS

✈ Empty weight

Weight 633 kg Arm 320 mm

👤 Pilot #1

Arm 410 mm Max. 0 kg

👤 Pilot #2

Arm 410 mm Max. 0 kg

👤 Passenger #1

Arm 1190 mm Max. 0 kg

👤 Passenger #2

Arm 1190 mm Max. 0 kg

🛢 Fuel tank #1

Arm 1120 mm Capacity 110 l Unusable 10 l

🛢 Fuel tank #2

When creating a new plane, FlightAssistant will propose a default set of weight station that you can edit. You can delete a weight station by tapping on the bin icon on the line of the weight station. You can add a weight station by tapping the “plus” button in the action bar at the top of the screen.

Please review the weight & balance section of the plane operations manual to collect the right data.

WARNING: For the fuel tanks the order is important. Indeed, when calculating the weight & balance at landing time and during flight, FlightAssistant consider you will **burn fuel starting from the last tank**. Therefore, you need to put your main tank first and then auxiliary tanks (if applicable) in a reverse order (compared to the order they will be emptied).

For fuel tanks, the context menu lets you change order.

It is to note as well that FlightAssistant will not let you define an “inconsistent” plane (you will not be able to delete the last pilot or the last fuel tank).

Obviously, the units used to define the weight stations are the ones you chose for the plane (tanks capacity, arms, weights, etc.).

It is to note that the weight station schema shown as an example here could be simplified (with just one stations for “Pilots” and one station for “Passengers” as they have the same arm).

Feel free to choose a layout that suits your needs, but make sure that it matches the actual plane specification.

➤ CENTER OF GRAVITY LIMITS

The center of gravity limits tab allows you define the envelope in which the C.G. should remain at any point in the flight.

This envelope is defined by a series of points placed on a arm-weight diagram.

Using the context menu, you can edit, insert, delete and reorder those points.

FlightAssistant will not let you have less than 3 points on this diagram.

When creating a new plane, FlightAssistant will propose a default diagram that you can use as a base to recreate the C.G. envelope of your plane.

Please review the weight & balance section of the plane operations manual to collect the right data.



Performing a weight & balance calculation

Once your plane is fully defined, including weight stations and C.G. limits, you can perform a weight & balance calculation.

In order to perform this calculation, you need to follow a simple 3-steps process:

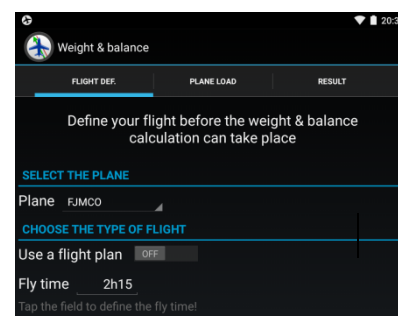
- Define your flight;
- Enter the loads of the plane;
- Analyse the results (that one is **really** important).

➤ DEFINING YOUR FLIGHT

There are 2 things that matter when calculating weight & balance: the plane you will fly, and how long you will fly.

You can easily pick a plane in the dropdown list that contains all the suitable planes (see above for a definition of “suitable”).

You then have two options to define your fly time: you can either enter the raw fly time if you know it (as in the example above) or use an existing flight plan.



In this case, a summary will be displayed that will show all the details of the fly time calculation. In the calculation we consider the “engine” time (or “block” time) which includes more than just the raw time to fly from point A to point B (taxi time, wind margin, etc.).



In the current version of FlightAssistant those “extra” times are not yet customizable but here is what they are:

- Wind margin: 10% of the raw time
- Approach: 5mn is the extra time required to perform approach procedures before landing
- Taxi time: 10mn on the departure airfield, 10mn on the arrival airfield.

The raw fly time is based on the total flight plan distance and the cruise speed only.

The plane (or its performances) used for ETE calculation is the one selected on the home page.

➤ DEFINING THE PLANE LOAD

Once you have selected the plane you will fly and defined how long you will fly, you can enter the various plane loads.

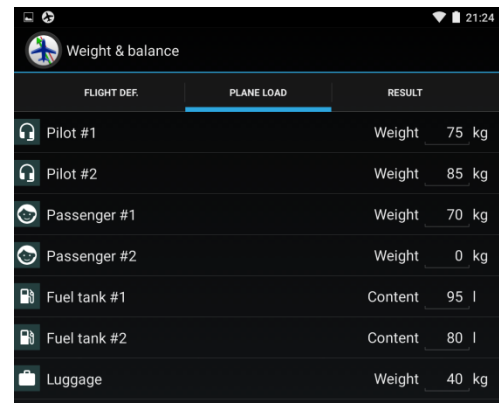
To do this you will use the weight stations that you have defined when creating the plane.

The values must be entered in a unit system that is consistent with the plane.

When a weight station is “empty” (for example no passenger, or no luggage) just enter a weight of “0” for this weight station.

It is to note that some limitations will apply:

- If you have entered a maximum weight for a weight station (different from 0) you will not be able to go over this value.
- Same applies to the tank maximum capacity.
- You will not be able to enter a tank content that is less than the unusable capacity of the tank (the unusable capacity cannot be used, so it stays in the tank).



FLIGHT DEF.	PLANE LOAD	RESULT
Pilot #1	Weight	75 kg
Pilot #2	Weight	85 kg
Passenger #1	Weight	70 kg
Passenger #2	Weight	0 kg
Fuel tank #1	Content	95 l
Fuel tank #2	Content	80 l
Luggage	Weight	40 kg

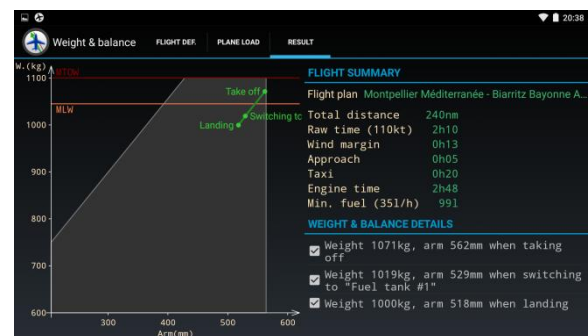
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➤ ANALYSING THE CALCULATION RESULTS

Once you have defined the plane load, you can switch to the result tab.

The results are presented in 3 parts:

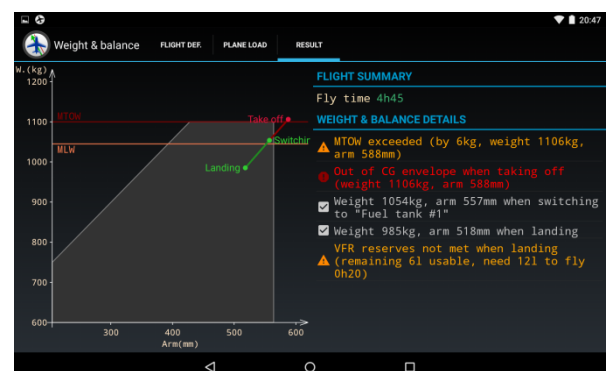
- The weight/arm graph that shows one point for each phase of the flight as well as C.G. envelope;
- The flight summary (fly time or flight plan details);
- The weight & balance calculation details.



If some anomaly has been detected in the calculation, it will be made obvious both in the C.G. graph and the calculation details.


FlightAssistant can show:

- Out of C.G. envelope (take-off, landing or switching tank)
- MTOW or MLW exceeded
- Not enough fuel on board
- Not enough VFR reserves (20mn).



The settings

The general settings

Access:  → General settings

The general settings allow you to manage those preferences that affect the behaviour of the application in a global way.

Preference	Action
"User interface" section	
Show tool bar only when "MENU" is pressed	When enabled, the Flight Assistant tools bar will only deploy when pressing the "MENU" key (and not when touching anywhere on the screen). This option is only available for those devices with a menu button.
"Units" section	
Show distances in kilometers	When checked, FlightAssistant will display distances in kilometers instead of nautical miles.
Show speed in km/h	When checked, FlightAssistant will display your speed in kilometers per hour instead of knots.
Show altitudes in meters	When checked, FlightAssistant will display altitudes in meters instead of feet.
GPS accuracy	Allows selecting the GPS accuracy threshold (GPS fixes with an accuracy less than the threshold will be ignored).
"Track recording" section	
Record track	FlightAssistant can record the track of your flight as a GPX file that you can later import in visualisation tools (like Google Earth).
Record track interval	If you record your track, you can choose how often a point will be recorded in the track file.
"External storage and network" section	
External storage	This allows you choosing the storage where FlightAssistant will store its file. This is only available on those devices that boast more than one external storage (SD card).

Maps directory	<p>This setting allows you to select the directory where the FlightAssistant maps will be read.</p> <p>By default, FlightAssistant will use <code>/sdcard/flightassistant/maps</code>, But depending on the space available on your device, you might want to store maps in another directory, or use maps from another application.</p> <p>WARNING: in the page where you are selecting the folder, use a "long press" on the folder that you want to select (a short press will open the folder).</p> <p>To revert to the default maps location, just select the default maps folder in the file chooser (<code>/sdcard/flightassistant/maps</code>).</p> <p>WARNING: if you change this setting, FlightAssistant will not move your old files to the new folder.</p> <p>It is therefore strongly advised to close the application, move the content of the FlightAssistant folder and launch the application again.</p>
Download via Wifi only	<p>If this option is enabled, the "large" downloads (documents, charts, diagrams, etc.) will only be enabled if a Wifi connection is available (they will not be enabled if only a 3G connection can be used).</p> <p>This does not affect the download of the more "transient" data like NOTAMs or TAFs and METARs that can be downloaded as long as there is a connection).</p>
"Document binder" section	
Half width	<p>This defines the airports that will be included in the "Navigation" tab when browsing the document binder (with a loaded flight plan).</p> <p>This is a distance from one of the legs of the flight plan.</p>
"Flight plan management" section	
Delete file after import	<p>When enabled, this option will cause the flight plan files that you import (from other software Navigation or GPX) to be deleted straight after import.</p> <p>This will help keeping your memory card tidy!</p>

Creating your own maps

FlightAssistant displays "tiled" map in TMS et Google¹⁵ formats.

Each map is a (large) set of image files, organised as a directory tree similar to "**map/Z/X/Y.ext**" where **map** is the map directory (and its name in FlightAssistant), **Z** is the zoom level (0 to 16), **X** is a figure calculated from the longitude and the zoom, **Y** is a figure calculated from the latitude and the zoom.

There are a few solutions that allow creating or downloading tiled maps in those formats ([Mobile Atlas Creator](#), [MapTiler](#)).

FlightAssistant is not delivered with any embedded map and you therefore need to build your map packages yourself (please visit our [YouTube channel](#) for some video tutorials on how to build and install maps).

Keep in mind though that it is not necessary to include all zoom levels in your maps (they would be very "heavy" and would take much more time to create or download). For VFR usage, the zoom levels 9 to 12 (possibly 13) look very sufficient. It is to note that each zoom level has 4 times more files than the previous zoom level (and is therefore 4 times bigger).

FlightAssistant allows applying a "digital zoom" that will upscale all your map tiles up on by one zoom.

For example, if you create a map with zooms 9 and 10 and check upscale, FlightAssistant will display it as 10 and 11, which will use circa 4 times less files (time and size).

There is small loss in sharpness, but it is an option that you might want to use if you want to save time or space on your device).

Once you have prepared your maps, copy them onto your device's SD card (and possibly unzipped them), you need to make sure that the final directory structure matches the following schema:

/sdcard/flightassistant/maps/MyOwnMap/Z/X/Y.ext

With:

- **/sdcard** is the path to your SD card or "external" storage (the actual path may vary, and it won't be **/sdcard** on your computer);
- **/flightassistant/maps** is the directory automatically created by FlightAssistant (at first launch or if the external storage path has been changed).
- **MyOwnMap** is a directory of your choice. FlightAssistant will use it as the name of this map.
- **Z/X/Y.ext** is the standard directory structure for tiled maps.

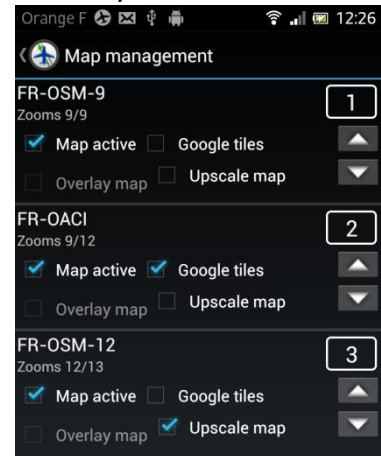
¹⁵ See the [MapTiler](#) documentation.

You can have maps with different zoom levels, but it is better if they have the same geographical coverage. You can have as well some maps that only cover a small area for a subset of the zoom levels and they can be set as overlays (for example terminal area zones).

You will access the maps management page thru the "Manage maps" in the settings section of the home page.

It is to note that as of version 0.8.10, FlightAssistant allows you to store your maps outside the default directory structure (`/sdcard/flightassistant`).

It is now possible to have your FlightAssistant directory on the internal memory of your phone and the maps on the secondary SD card.




User waypoints management

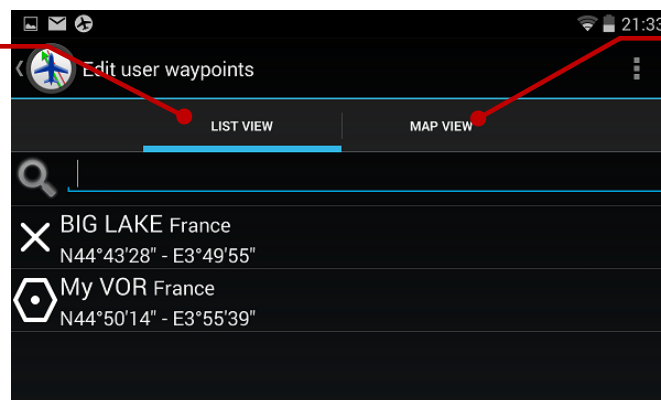
FlightAssistant allows you to store and manage "user waypoints" in the AIP database (aeronautical information) on top of the data that can be downloaded automatically from our servers.

User waypoints are different from the "on the fly" waypoints used in flight plans. They will remain stored in the database.

➤ CREATING USER WAYPOINTS

Creating a geographical point is much easier when done directly on a map, this is why we have limited the ability to create user waypoints from the map when creating flight plans and on the map the "MAP VIEW" tab in the "Manage points" screen ( → Manage user points).

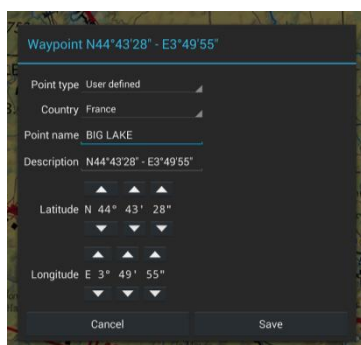
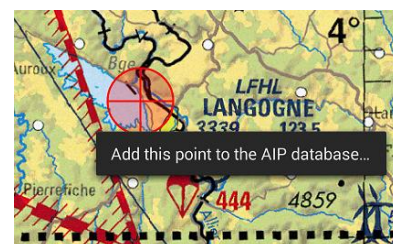
View user waypoints in list mode (as shown here)



View user waypoints on the map

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Use a long press to access the context menu, it will show "Add this point to the AIP database...".

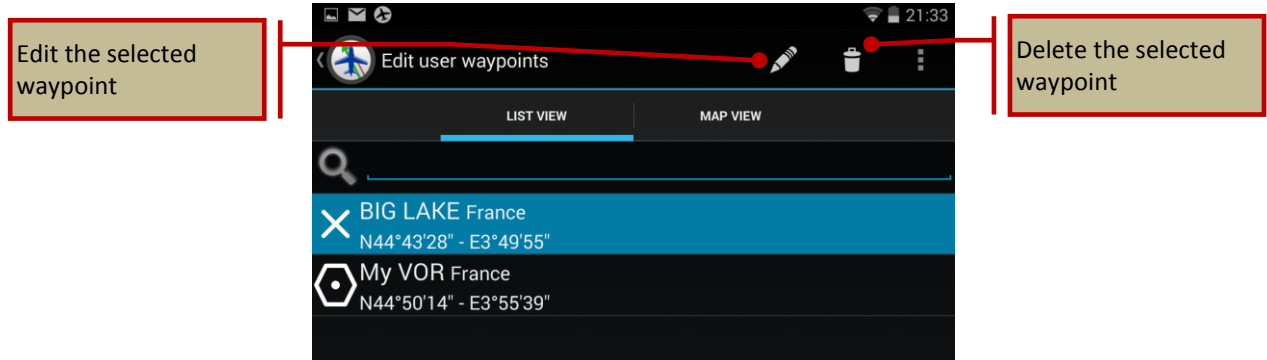


Once you select this, you can rename the point, select its country and type and even finely tune coordinates.

Note: The list of countries is long, and it can be a bit tedious, but, after the first one, it will default to the previous one you used.

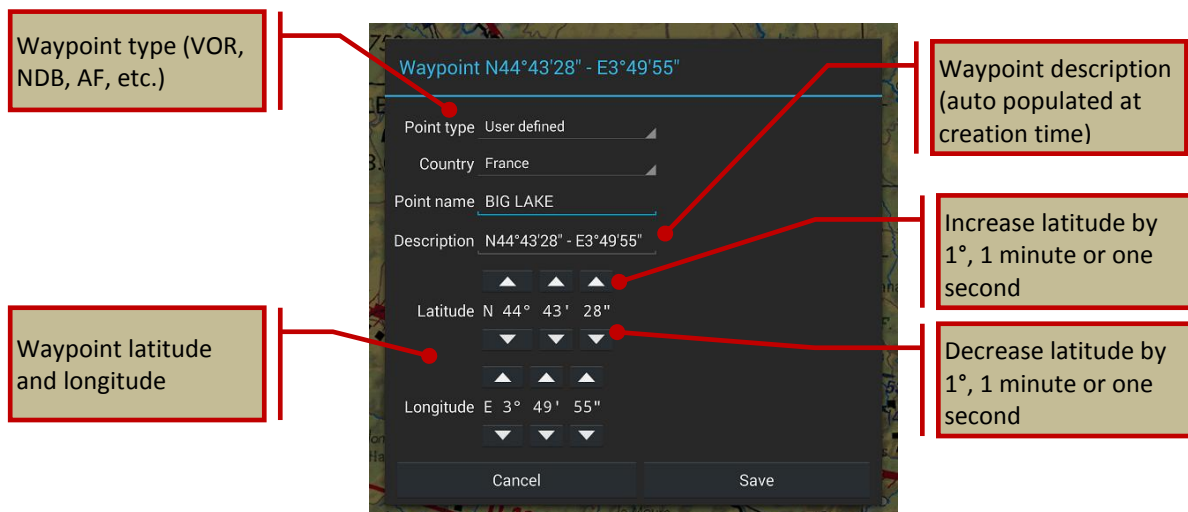
➤ EDITING & DELETING USER WAYPOINTS

You can edit & delete user waypoint either by selecting them in the list view or via the context menu on the user waypoint map or the edit flight plan map (long press nearby the waypoint that you want to edit or delete).



You can edit all the data that defines the waypoint and you can even fine tune its coordinates (down to 1 second of latitude & longitude, less than 60 yards depending where you are).

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➤ EXPORTING USER WAYPOINTS AND PURGING THE LIST

The option menu on the user waypoint page allows you to export the whole list of user waypoints and you can delete them all at once as well.

The waypoints will be exported to an auto-named file in the FlightAssistant directory.

➤ IMPORTING POINTS

If you need to create a lot of points, you can import them in FlightAssistant via a text file rather than creating them one by one on the map.

Warning: Copy the file to be imported to your device's SD card or storage before processing.

Access (from the user waypoints page): Menu ➔ Import points

The import process accepts text files with tabulation, comma or semicolon separator. The file must start with a header line (same separator) that defines the content of each column and that accepts the following values.

Key	Content	Example
country_code	ISO country code	FR, GB, US
name	Name of the point	LFMT, MTL
description	Description of the point	
type	Internal code that defines the point type (see annex Types of points). Warning, if provided, it must be a known type. If not provided, the type will be "user point".	AF.AD RN.VOR
lat	Latitude of the point, as decimal degrees. Positive values for East latitudes, negative values for West latitudes.	4.53245 -2.58951
lon	Longitude of the point as decimal degrees. Positive values for North longitudes, negative values for South longitudes.	44.89546 -18.45641
elevation	Elevation of the point (in feet).	17

Only the fields in **red** are mandatory (the country and type are mandatory as well but you will be able to choose a default value at the time of import).

Beware that you should choose your separator carefully as it must not be present in any point name or description (in other words, go for TAB, it is much safer).

A sample import file can be found [here](#).

Annexes

Types of points

When importing points from a text file, the "type" field can have one of the following values.

Type	Description
AF.AD	Airfield
AF.UL	Ultra light airfield
AF.H	Heliport / helipad
RN.VOR	VOR
RN.NDB	NDB
RN.VOR-DME	VOR DME
RN.VORTAC	VORTAC
RN.TACAN	TACAN
RP	Reporting point
IT	Intersection
PL.CITY	City
PL.OBSTACLE	Obstacle
US	User defined